THE EFFECTS OF UNIVERSITY PREPARATORY COURSES AND MASTERY LEARNING ON FINAL ACHIEVEMENT TEST SCORES AND UNIVERSITY ENTRANCE EXAM SCORES OF SENIORS IN A TURKISH HIGH SCHOOL

by

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TABLE OF CONTENTS

LIST OF TABLES

LIST OF FIGURES

LIST OF GRAPHS

ABSTRACT

The main concern of this study is two-fold. One is to investigate the combined effects of Mastery Learning Method of Instruction and attendance to a Private University Preparatory Institution on measures related to school achievement. These measures are the parallel forms of the Pre-test scores on Mathematics, Physics and Chemistry and summative test scores on these three subject areas. Another issue of this study is to test the combined effects of Private University Preparatory Institution attendance and Mastery Learning Method of Instruction on measures which are related to university entrance examinations. These measures include the scores on the Mathematics and Science Tests similar to those given by the Student Placement Examination (ÖYS, 1986), scores on the test given by the Association of Private University Preparatory Institutions (Özdebir, 1987), Student Selection Examination (ÖSS, 1987) and Student Placement Examination (ÖYS, 1987). The study is carried out at a public high school in Istanbul. The 136 senior students which constituted the sample of the study are chosen from 11 science sections in the final year of this lycée. Two instructional methods are used at the school setting for four different groups of seniors in this research. The first group (section H) is instructed under Mastery Learning Method of Instruction and attended a Private University Preparatory Institution. The second group is derived from four sections (sections C, F, J, K) all instructed under

Mastery Learning Method of Instruction but not attending a Private University Preparatory Institution. The third group (section E) is instructed under conventional methods of instruction but attended a Private University Preparatory Institution. The last group is the control group derived from sections (sections A, B, D, G, I) instructed under conventional methods of instruction and not attending any Private University Preparatory Institutions.

The hypotheses of the study are:

HYPOTHESIS 1: The scores of the students in the four groups (ML+UPI, UPI, ML and control) will not significantly differ from one another on the Mathematics, Physics and Chemistry Pre-tests.

HYPOTHESIS 2: There will be a significant effect of Mastery Learning Method of Instruction and Private University Preparatory Institution attendance on the parallel forms of the Pre-tests in Mathematics, Physics and Chemistry.

HYPOTHESIS 3: There will be a significant effect of Mastery Learning Method of Instruction and Private University

Preparatory Institution attendance on the Mathematics, Physics and Chemistry Summative Tests.

HYPOTHESIS 4: There will be a significant effect of Private University Preparatory Institution attendance and Mastery Learning Method of Instruction on the Mathematics and Science Tests similar to those given on the Student Placement Examination (ÖYS, 1986).

HYPOTHESIS 5: There will be a significant effect of Private University Preparatory Institution attendance and Mastery Learning Method of Instruction on the Test given by the Association of Private University Preparatory Institution (Özdebir, 1987).

HYPOTHESIS 6: There will be a significant effect of Private University Preparatory Institution attendance and Mastery Learning Method of Instruction on the Student Selection Examination (ÖSS, 1987).

HYPOTHESIS 7: There will be a significant effect of Private University Preparatory Institution attendance and Mastery Learning Method of Instruction on the Science scores of the Student Placement Examination (ÖYS-Fen, 1987).

HYPOTHESIS 8: There will be a significant effect of Private University Preparatory Institution attendance and Mastery Learning Method of Instruction on the Mathematics scores of the Student Placement Examination (ÖYS-Mat, 1987).

HYPOTHESIS 9: There will be a significant effect of Private University Preparatory Institution attendance and Mastery Learning Method of Instruction on the combined Turkish/Mathematics scores of the Student Placement Examination (ÖYS-TM, 1987).

These nine hypotheses of the study are statistically tested, by utilizing one-way analyses of variance, two-way analyses of variance, the Newman-Keuls formula, t-tests, E correlation ratios and effect size

analyses. The results of the data obtained in this study show that:

1. The scores of the students in the four groups significantly differ from one another at the. 05 significance level for the Mathematics Pre-test, at the .00001 significance level for the Physics Pre-test and at the .0001 significance level for the Chemistry Pre-test.

2. Mastery Learning Method of Instruction and Private University Preparatory Institution attendance have an effect on achievement on the Parallel forms of the Mathematics, Physics and Chemistry Pre-tests, the effect of Mastery Learning alone being much more sizeable than the effect of Private University Preparatory Institution attendance. Mastery Learning Method of Instruction affects achievement at the .0001 level of significance for the Parallel Form of the Mathematics Pre-test, at the .0001 level of significance for the Parallel Form of the Physics Pre-test, and again at the same level of significance for the Parallel Form of the Chemistry, Pre-test. Likewise, Private University Preparatory Institution attendance affects achievement at the .024 level of significance for the Parallel Form of the Mathematics Pre-test and at the .0001 level of significance for the Parallel Form of the Physics Pre-test. However, the effect of Private University Preparatory Institution attendance is not significant on the Parallel Form of the Chemistry Pre-test. Mastery Learning

Method of Instruction accounts alone for 23%, 30%, and 21% of the variation in achievement on the Parallel Forms of the Mathematics, Physics and Chemistry Pre-tests, respectively. Private University Preparatory Institution attendance accounts for 3% of the variance in Mathematics, 13% in Physics and 2% in Chemistry.

3. Mastery Learning Method of Instruction and Private University Preparatory Institution attendance affect achievement on the Mathematics, Physics and Chemistry Summative Tests. Mastery Learning Method of Instruction produces a significant effect at the .01 level, at the .036 level and at the .05 level for the Mathematics, Physics and Chemistry Summative Tests, respectively. Similarly, Private University Preparatory Institution attendance affects achievement at the .02 level of significance for the Mathematics Summative Test and at the .05 level of significance for the Chemistry Summative Test. Private University Preparatory Institution attendance does not affect achievement on the Physics Summative Test significantly. Mastery Learning Method of Instruction accounts alone for 4% of the variation in Mathematics and 3% of the variance both in Physics and in Chemistry. On the other hand, attending Private University Preparatory Institution accounts alone for 4% in Mathematics and 3% in Chemistry. This variable does not account for much of the variance in achievement on the Physics Summative Test.

4. Private University Preparatory Institution attendance has an effect on achievement on the Mathematics Test similar to the one given on the Student Placement Examination (ÖYS, 1986) at the .001 level of significance and at the .0001 level of significance on the Science Test similar to the one given on the Student Placement Examination (ÖYS, 1986). The affect of Mastery Learning Method of Instruction on these two tests is not significant.

5. Private University Preparatory Institution attendance produces a significant effect at the .03 level on the Test given by the Association of Private University Preparatory Institution (Özdebir, 1987) whereas the effect of Mastery Learning Method of Instruction is not significant.

6. Private University Preparatory Institution attendance affects achievement on the Student Selection Examination (ÖSS, 1987) at the .0001 level of significance while the effect of Mastery Learning Method of Instruction is not significant.

7. Private University Preparatory Institution attendance has an impact on achievement at the .0001 significance level on the Science scores of the Student Placement Examination (ÖYS-Fen, 1987). On the other hand, the impact of the other variable, that is, Mastery Learning Method of Instruction is not significant.

8. Private University Preparatory Institution attendance affects achievement at the .0001 level of significance for the Mathematics scores of the Student Placement Examination (OYS-Mat, 1987), while Mastery Learning Method of Instruction does not affect achievement.

9. Private University Preparatory Institution attendance affects achievement at the .01 significance level for the combined Turkish/Mathematics scores of the Student Placement Examination (OYS-Mat, 1987) whereas the impact of Mastery Learning Method of Instruction is not significant.

ÖZET

Bu çalışmanın iki amacı vardır. Bunlardan ilki Tam Öğrenme Yöntemi ile birlikte Üniversite Hazırlık Kurslarına Devam'ın ders yılı içindeki Lise III Matematik, Fizik ve Kimya dersleri başarı düzeyine etkilerini saptamaktır. Çalışmanın ikinci amacı ise yine Üniversite Hazırlık Kurslarına Devam ile Tam Öğrenmenin Üniversite birinci ve ikinci aşama giriş puanları ve benzerlerine etkilerini belirlemektir. Çalışma, İstanbul'da orta-sosyo-ekonomik düzey çocukların gittiği ve kız-erkek öğrencilerin birlikte eğitim gördükleri resmi bir lisede yapılmıştır. Araştırma, son sınıf 11 Fen şubesinin tümünü içermiş, ancak örneklem için toplam 495 öğrenciden 55 kız, 81 erkek, 136 öğrenci çalışma kapsamına alınmıştır. Okulun bir Edebiyat şubesi araştırma dışı bırakılmıştır. Çalışma için 4 ayrı grup oluşturulmuştur. Bunlardan ilki bu dersleri Tam Öğrenme Yöntemi ile işlemiş, ayrıca Üniversite Hazırlık Kurslarına devam etmiştir. Bu grup için sadece 1 şube (H şubesi) kullanılmıştır. İkinci grup bu dersleri Tam Öğrenme ile görmüş, ancak Hazırlık Kurslarına devam etmemiştir. Bu grup için 3 ayrı derste 4 ayrı şubede (C, F, J, K şubeleri) Tam Öğrenme Yöntemi uygulanmıştır. Üçüncü grup ise bu dersleri geleneksel şekilde işlemiş, yalnız Üniversite Hazırlık Kurslarına devam etmiştir. Bu grup için de 1 şube (E şubesi) kullanılmıştır. Dördüncü grup (kontrol grubu) ise ne bu dersleri Tam Öğrenme Yöntemi ile görmüş, ne de Üniversite Hazırlık Kurslarına devam etmiştir. Yine kontrol grubu içine

alınacak öğrencileri oluşturmak için 5 ayrı şubeden (A, B, D, G, I) kursa girmeyen öğrenciler çalışma kapsamına alınmıştır.

Bu çalışmanın deneceleri şunlardır:

Denence 1: 4 grup öğrencinin Matematik, Fizik ve Kimya ön-test puanları farklı olmayacaktır.

Denence 2: Tam Öğrenme ve Üniversite Hazırlık Kurslarına Devam'ın Matematik, Fizik ve Kimya ön-testlerinin paralelleri üzerindeki etkileri önemli düzeyde olacaktır.

Denence 3: Tam Öğrenme ve Üniversite Hazırlık Kurslarına Devam'ın Matematik, Fizik ve Kimya devre sonu erişi testleri üzerindeki etkileri önemli düzeyde olacaktır.

Denence 4: Üniversite Hazırlık Kurslarına Devam ve Tam Öğrenme'nin 1986 ÖYS Fen ve Matematik Sınavlarına paralel sınavlar üzerindeki etkileri önemli düzeyde olacaktır.

Denence 5: Üniversite Hazırlık Kurslarına Devam ve Tam Öğrenme'nin Özel Dersaneler Birliği

tarafından hazırlanan Özdebir, 1987 sınavı üzerindeki etkileri önemli düzeyde olacaktır.

Denence 6: Üniversite Hazırlık Kurslarına Devam ve Tam Öğrenme'nin Öğrenci Seçme Sınavı (1. aşama) ÖSS 1987 üzerindeki etkileri önemli düzeyde olacaktır.

Denence 7: Üniversite Hazırlık Kurslarına Devam ve Tam Öğrenme'nin Öğrenci Yerleştirme Sınavı, Fen Testi (ÖYS-Fen, 1987) üzerindeki etkileri önemli düzeyde olacaktır.

Denence 8: Üniversite Hazırlık Kurslarına Devam ve Tam Öğrenme'nin Öğrenci Yerleştirme Sınavı, Matematik Testi (ÖYS-Mat, 1987) üzerindeki etkileri önemli düzeyde olacaktır.

Denence 9: Üniversite Hazırlık Kurslarına Devam ve Tam Öğrenme'nin Öğrenci Yerleştirme Sınavı, Türkçe/Matematik puanları (ÖYS-TM, 1987) üzerindeki etkileri önemli düzeyde olacaktır.

Bu 9 denence 1-yönlü varyans analizleri, 2-yönlü-varyans analizleri, Newman-Keuls formülü, t-testleri, E

korelasyon orantıları ve etki oranları teknikleriyle sınanmıştır.

Bu çalışmadan elde edilen bulgular şunlardır:

1. 4 grup öğrençinin ön-test puanları, Matematik ön-testinde .05, Fizik ön-testinde .00001, Kimya ön-testinde ise .0001 önemlilik düzeylerinde farklıdır.

2. Tam Öğrenme ve Üniversite Hazırlık Kurslarına Devam'ın Matematik, Fizik ve Kimya ön-testlerinin paralelleri üzerindeki etkileri önemli düzeydedir. Tam Öğrenmenin etkisi, Matematik Fizik ve Kimya ön-test paralellerinde .0001 önemlilik düzeyindedir. Üniversite Hazırlık Kurslarına Devam'ın ise Matematik ön-test paralelinde .024, Fizik ön-test paralelinde ise .0001 önemlilik düzeylerinde etkisi vardir. Bu değişkenin Kimya ön-test paralelinde önemli bir etkisi görülmemektedir. Tam Öğrenme Matematik ön-test paralelinde değişkenliğin %23, Fizik ön-test paralelinde %31'ini, Kimya ön-test paralelinde ise değişkenligin %21'ini açıklarken, Üniversite Hazırlık Kurslarına Devam Matematik ön-test paralelinde %3'ünü, Fizik ön-test paralelinde %13'ünü, Kimya ön-test paralelinde ise değişkenliğin %2'sini açıklamaktadır. Tam Öğrenme ön-test paralelleri üzerinde çok etkindir, bu etki yine önemli düzeyde olan Kursa Devam'in etkisinden çok daha fazla düzeydedir.

3. Tam Öğrenme ve Üniversite Hazırlık Kurslarına Devam'ın Matematik, Fizik ve Kimya devre sonu erişi testleri üzerindeki etkileri önemli düzeydedir. Tam Öğrenmenin etkisi, Matematik erişi testinde .01, Fizik erişi testinde .036, ve Kimya erişi testinde ise .05 önemlilik düzeylerindedir. Üniversite Hazırlık Kurslarına Devam, Matematik erişi testinde .02, Kimya erişi testinde ise .05 önemlilik düzeylerinde etkilidir. Bu değişkenin Fizik erişi testinde bir etkisi gözükmemektedir. Tam Öğrenme, Matematik erişi testinde değişkenliğin %4'ünü açıklarken, Fizik ve Kimya erişi testlerinde değişkenliğin %3'ünü açıklamaktadır. Üniversite Hazırlık Kurslarına Devam ise Matematik erişi testinde değişkenliğin %4'ünü, Kimya erişi testinde de %3'ünü açıklamaktadır. Kursa Devam Fizik başarısını açıklamaktadır.

4. Üniversite Hazırlık Kurslarına Devam'ın ÖYS 1986 Matematik ve Fen sınavlarına eş-değer sınavlar üzerindeki etkisi önemli düzeyde olup, bu testler üzerinde Tam Öğrenmenin etkisi gözükmemektedir. Kursa Devam Matematik testinde .001 düzeyinde, Fen testinde ise .0001 düzeyinde etkili olup, Tam Öğrenme'nin bir etkisi görülmemektedir.

5. Üniversite Hazırlık Kurslarına Devam'ın Özel Dersaneler Birliği tarafından hazırlanan Özdebir, 1987 sınavı üzerinde etkisi vardır; Tam Öğrenme Yönteminin bir etkisi yoktur. Üniversite Hazırlık Kurslarına Devam Özdebir 1987 Sınavı üzerinde .03 düzeyinde etkilidir.

6. Üniversite Hazırlık Kurslarına Devam Öğrenci Seçme Sınavı (I. aşama) ÖSS, 1987 üzerinde etkili olup, Tam Öğrenmenin bir etkisi görülmemektedir. Kursa Devam ÖSS, 1987 sınavı üzerinde .0001 düzeyinde etkilidir.

7. Üniversite Hazırlık Kurslarına Devam Öğrenci Yerleştirme Sınavı, Fen testi (ÖYS-Fen, 1987) üzerinde etkilidir; Tam Öğrenme Yönteminin bir etkisi görülmemektedir. Kursa Devam, ÖYS-Fen testinde .0001 düzeyinde etkilidir.

8. Üniversite Hazırlık Kurslarına Devam Öğrenci Yerleştirme Sınavı, Matematik testi (ÖYS-Mat, 1987) üzerinde etkili olup; Tam Öğrenmenin bir etkisi yoktur. Hazırlık Kurslarına Devam'ın, ÖYS-Mat testinde .0001 düzeyinde etkisi görülmektedir.

9. Üniversite Hazırlık Kurslarına Devam Öğrenci Yerleştirme Sınavı, Türkçe-Matematik puanları (ÖYS-TM, 1987) üzerinde önemli düzeyde etkilidir; Tam Öğrenme'nin bir etkisi görülmemektedir. Kursa Devam ÖYS Türkçe/Matematik puanları üzerinde .01 düzeyinde etkilidir.

CHAPTER I

INTRODUCTION: STATEMENT OF THE PROBLEM

It was until only about two decades ago that differences in the learning level of students were attributed to their varying learning capacities. The learning capacity for school achievement differing from one individual to another was regarded as something usual and inevitable. Genetics, motivation, aptitude, ability and intelligence were the main concepts which were to explain the differences in school achievement among students (Bloom, 1976). Recently, educators have realized that if students are provided with appropriate learning conditions, they would differ in the rate which they can learn but not in their levels of achievement, while their basic learning capacity remains the same (Carroll, 1963; Bloom, 1968). It has been shown that individual differences in learning outcomes can gradually be minimized; in Bloom's words they will reach a vanishing point including both level and rate of learning (Bloom, 1971; Anderson, 1973) as well as effective outcomes.

Research done for over two decades indicates that 90% of students can learn the subjects they study up to the same level that only the top 10% of the students have been learning under normal school conditions (Bloom, 1972; Block, 1971, 1974).

Research on the ways in which school curricula and instruction could be improved, led to the development of both a theory and a method of instruction which is known as Mastery Learning.

The basic idea underlying Mastery Learning is that the majority of the students can attain a high level of learning capability through sensitive and systematic instruction. In this approach, students are helped when and where they have learning difficulties through feedback and corrective techniques as well as being given sufficient time to achieve mastery. Further research shows that under both school and quasi-laboratory conditions, studying under Mastery Learning Method of Instruction helps the students reach levels of achievement which are about one standard deviation above the mean achievement levels in classes studying under conventional methods of instruction (Bloom, 1984).

Yildiran (1977) investigated the effect of high levels of achievement on other learning criteria. She found that level of achievement affects retention, transfer and the use of higher mental processes. Her research demonstrates that retention, transfer, higher and lower mental processes, and effective outcomes are affected by the level of learning not as was thought before by the rate of learning, aptitude, IQ, or time related effort. She also states that the students will be successful on other

learning criteria if they learn the given material adequately through the implementation of Mastery Learning Method of Instruction.

Another study done by Durnin and Yıldıran (1987) tested the effects of combining Mastery Learning techniques with teaching for creativity in learning a second language. According to this study, the group that received both interventions, namely Mastery Learning and teaching for creativity methods, performed on all measures significantly higher than the controls. As Durnin and Yıldıran state (1987) the most striking result of the study is that, mastery of the content enhances one's performance on creative tasks as it can be seen from the results obtained by the Mastery Learning only group on the creative and transfer tasks. In addition to this, when instruction is focused on the use of higher mental processes, this helps learning on lower mental processes although they are not emphasized during teaching as illustrated by the results of creativity only group in content learning.

Research done for many years show that Mastery Learning increases levels of achievement in learning. However, the educational researchers are now looking for other interventions which when added to Mastery Learning Method of Instruction, increase achievement levels still further. Among these additional variables are Improved Teaching, Improved Materials, provision of necessary

prerequisites and home intervention. Although a thorough explanation of the research done on Mastery Learning Method of Instruction will be presented in the Survey of Literature Chapter, it is useful to mention some of the studies that are carried out in Turkey in relation to this "two sigma problem".

Afreşa (1983) investigated whether Mastery Learning which enables a majority of students to reach high levels of learning also enables them to retain better the material learned in comparison to students under normal school conditions. Her findings suggest that the achievement levels of the Mastery Learning group is significantly higher than the control class. In addition to this, the retention scores of Mastery Learning students are again significantly higher than the control group. As the findings demonstrate, there is a difference of 2.2 standard deviations between the mean performances of the Mastery Learning and control groups on the summative test scores. Similarly, there is again a difference of 2.1 standard deviations between the mean performances of the Mastery Learning and control groups on retention scores. These differences favoring the Mastery Learning students can be attributed to Improved Teaching which is defined as the training of the teacher implementing this strategy on both the theory and method of learning as well as its application to the classroom environment. As Yıldıran states "According to Bloom, there are other interventions which when added to Mastery Learning raise the

level of learning to 2 standard deviations above the mean of the control class" (Yildiran, 1985, p.115-116).

Bloom states that Improved Teaching in addition to the implementation of Mastery Learning Method of Instruction will have an additive effect on the achievement level. Nwabueze (1984) tested the combined effect of Mastery Learning Method and Improved Teaching. His results suggest that the class which studied under Mastery Learning in addition to Improved Teaching scored not only higher than the control class, but also significantly higher than Mastery and Improved Teaching classes. Moreover, the effects of Improved Teaching and Mastery Learning on student achievement were additive. Yıldıran states that, "according to Bloom, Improved Teaching is one way to raise the level of learning above those made possible by Mastery Learning. Another way of increasing student achievement is improving the instructional materials (Yıldıran, 1985, p.9). A study done by Eğinlioğlu (1985) tested the effects of Mastery Learning and Improved Materials an achievement. She found that the class instructed under Mastery Learning in addition to Improved Materials scored not only higher than the control class but also reached higher levels of achievement than the class instructed under Mastery Learning alone. Another study done by Sayar (1986), in which two interventions are again implemented, shows that the combined effects of Mastery Learning Method of Instruction in addition to the provision of Cognitive Entry Behaviors

produces higher achievement levels than those obtained through Mastery Learning or Cognitive Entry Behaviors alone. Furthermore, the effects of the two interventions are additive.

The formal educational system in Turkey has been established at the beginning of Turkish Republic. Although the system has undergone several changes, the basic structure remains the same. Formal education in Turkey starts with a five-year primary school which is compulsory (Yıldıran, 1988). This is followed by Junior high schools (Orta Okul) which offer general education with some exceptions. Senior high schools (lycée) consist of two types: The lycée which offers general education and prepares for the university: vocational and technical schools which offer a variety of programs preparing for occupations. Universities complete the formal education system offering undergraduate and graduate programs in sciences, arts, and professions (Oğuzkan, 1981).

Within this system there is a sharp division between academic (lycée) and specialized schools (vocational and technical) at the level of senior high schools. The dominant academic school is the lycée. It provides general education and prepares for universities and other types of higher studies. There are various kinds of specialized schools including industrial high schools, vocational high schools for girls, commercial high schools as well as

health, religious, agricultural, military and other types of high schools. Their duration and offerings vary; they typically offer three year programs while some of the technical schools namely technical lycées offer a four year program (Oğuzkan, 1981).

The insufficient number of vocational and technical schools in Turkey, and the prestige gained by being a graduate of a higher education institution increase the demand for university education and thousands of lycee students seek university education opportunities. In our present Turkish educational system, graduates of vocational and technical schools have the opportunity to continue with their higher education. Moreover, since 1984, graduates of vocational and technical schools are given additional score points if they plan to study in a program related to their previous education (ÖSYM, February, 1985).

The capacity of the Turkish universities is not sufficient to meet the increasing demand of students graduating from lycées and those who want to continue with higher education as graduates of technical and vocational schools. Thus, students willing to pursue higher education are required to take a centralized exam which is given for selection and placement purposes. This examination is administered once a year in two stages.

The factors that are mentioned so for have given rise in the emphasis for the need of several Private

University Preparatory Institutions. These institutions offer their courses in such a way that they tap the objectives and skills required by the entrance examinations as well as provide these skills to students. In addition to this, Private University Preparatory Institutions coach students by exposing them to previously used tests and most importantly, teach them test techniques. Some of the Private University Preparatory Institutions which are usually found in big cities gain reputation over the others and are believed to be better than others in having their students placed in universities. It has even become difficult to enter some of the Private University Preparatory Institutions because they also implement a selection system and choose their students according to the level of success in high school and the type of school from which they come.

Although it is generally expected that students who are successful in school will score higher on the university entrance exam, because of the increasing spirit of competition and the big differences of quality of instruction among high schools, most students attend these Private University Preparatory Institutions. For example, in Fenerbahçe Lycée where the present study is conducted, out of 495 students in 11 science sections, only 12.53% did not attend any Private University Preparatory Institutions, and 87.47% of this total group attended a Private University Preparatory Institution.

The main concern of this study is two-fold. One is to investigate the combined effects of Mastery Learning Method of Instruction and Private University Preparatory Institution attendance on measures related to school achievement. These measures include the parallel forms of the Pre-test scores on Mathematics, Physics and Chemistry and summative test scores on the three subject areas. Another issue of this study is to test the combined effects of Mastery Learning Method of Instruction and Private University Preparatory Institution attendance on measures which are related to university entrance examination. These measures consist of the scores on the Mathematics and Science tests similar to those given by the Student Placement Examination (OYS, 1986), scores on the Test given by the Association of Private University Preparatory Institutions (Ozdebir, 1987), Student Selection Examination (OSS, 1987) and Student Placement Examination (OYS, 1987) scores.

Two instructional methods were used at the school setting for four different groups of the 11th graders in the study:

1. One group (section H) was instructed under Mastery Learning Method of Instruction at school and attended a Private University Preparatory Institution (ML + UPI).

2. One group derived from four sections (sections C, F, J, K) was instructed under Mastery Learning Method of Instruction at school, but did not attend a Private University Preparatory Institution (ML).

3. One group (section E) was instructed under conventional methods of instruction at school, but attended a Private University Preparatory Institution (UPI).

4. One control group derived from 5 sections (sections A, B, D, G, I) was instructed under conventional methods of instruction at school, and did not attend any Private University Preparatory Institutions (control).

Nine hypotheses are tested in this study. They are as follows:

HYPOTHESIS 1. The scores of the students in the four groups (ML+UPI, UPI, ML, C) will not significantly differ from one another on the Mathematics, Physics and Chemistry Pre-tests.

HYPOTHESIS 2. There will be a significant effect of Mastery Learning Method of Instruction and Private University Preparatory Institution attendance on the parallel forms of the Pre-tests in Mathematics, Physics, and Chemistry.

HYPOTHESIS 3. There will be a significant effect of Mastery Learning Method of Instruction and Private University Preparatory Institution attendance on the Mathematics, Physics, and Chemistry Summative Tests.

HYPOTHESIS 4. There will be a significant effect of Private University Preparatory Institution attendance and Mastery Learning Method of Instruction on the Mathematics and Science Tests similar to those given on the Student Placement Examination (OYS, 1986).

HYPOTHESIS 5. There will be a significant effect of Private University Preparatory Institution attendance and Mastery Learning Method of Instruction on the Test given by the Association of Private University Preparatory Institutions (Özdebir, 1987).

HYPOTHESIS 6. There will be a significant effect of Private University Preparatory Institution attendance and Mastery Learning Method of Instruction on the Student Selection Examination (ÖSS, 1987).

HYPOTHESIS 7. There will be a significant effect of Private University Preparatory Institution attendance and Mastery Learning Method of Instruction on the Science Scores of the Student Placement Examination (ÖYS-Fen, 1987).

HYPOTHESIS 8. There will be a significant effect of Private University Preparatory Institution attendance and Mastery Learning Method of Instruction on the Mathematics scores of the Student Placement Examination (ÖYS-Mat, 1987).

HYPOTHESIS 9. There will be a significant effect of Private University Preparatory Institution attendance and Mastery Learning Method of Instruction on the combined Turkish/Mathematics scores of the Student Placement Examination (ÖYS - TM, 1987).

The next chapter deals with the appropriate Survey of Literature about Mastery Learning Method of Instruction as well as the historical backgrounds of the Student Selection and Placement Examination (ÖSYS) and Private University Preparatory Institutions.

CHAPTER II

SURVEY OF LITERATURE

The main concern of this study is two-fold. One is to investigate the combined effects of Mastery Learning Method of Instruction and attendance to a Private University Preparatory Institution on measures related to the school curriculum within the formal education system including the parallel forms of the pre-test scores on Mathematics, Physics and Chemistry, and summative test scores on these three subject areas. Another issue of this study is to test the combined effects of Mastery Learning Method of Instruction and attendance to a Private University Preparatory Institution on measures related to university entrance examinations including scores on the Mathematics and Science Tests similar to those given on the Student Placement Examination (ÖYS, 1986), scores on the test given by the Association of Private University Preparatory Institutions (Özdebir, 1987), Student Selection Examination (ÖSS, 1987) and Student Placement Examination scores (ÖYS, 1987).

Mastery Learning Method of Instruction which was originally developed by Benjamin Bloom in 1986 is chosen as a method for this study because research done until now shows that Mastery Learning Method of Instruction is a strong method in raising achievement levels of students.

Moreover, Mastery Learning both as a theory and method can be easily implemented within the formal education system at every level.

Research findings indicate that a large percentage of students can reach a level of achievement through Mastery Learning that is reached by less than one fifth of the students under conventional methods of instruction. Research done by Airasian (1969), Hogwan (1970), and Kersh (1971) show that Mastery Learning Method of Instruction produces achievement levels that are approximately one standard deviation over the control class instructed under traditional methods. Studies done by Block (1971, 1974), and by Peterson (1972) also demonstrate that Mastery Learning strategy helps four-fifths of students attain mastery and reach a high level of achievement whereas only one-fifth of the students instructed under normal school conditions reach this level. The reasons why a majority of students reach high levels of achievement when Mastery Learning Method of Instruction is used can be summarized in Bloom's words as follows: "The notion underlying Mastery Learning is that most students can attain a high level of learning capability if instruction is approached sensitively and systematically, if students are helped when and where they have learning difficulties, if they are given sufficient time to achieve mastery and if there is some clear criterion of what constitutes mastery" (Bloom, 1976, p.4).

Carroll states that (1963), instruction must be adapted according to the different needs and the characteristics of the learner. He stressed the importance of time needed and spent in learning. According to Carroll, if the student is given the appropriate time helshe needs and if helshe spends the necessary time to learn a given subject, it would be possible for himlher to reach a pre-set criterion level. He also stertes that if the ratio of the time needed and time spent on a particular subject equals 1, then learning will be perfect.

Some other research done by Bloom (1976), Harnischfeger and Wiley (1974), and Rosenshine and Berliner (1978) present similar results showing that time is an important determinant in the degree of learning.

Bloom states that (1976) if sufficient time for each learner according to hislher characteristics and needs is provided, the student will learn the task adequately.

In the Anderson's study (1973), the students' use of time was studied. Anderson found that at the beginning, the Mastery and control classes were on task about the same percent of time. Their achievement on the first learning task was approximately equal. The two groups started to diverge on the second learning task and even more on the third learning task; the difference in achievement and the percentage of time-on-task being increased in favor of the Mastery Learning students.

Studies done by Anderson (1973), and Özçelik (1974) indicate that if the pupils spend the required time in learning, then the learning will become greater.

Students differ in the rate of learning in school-related tasks, Block (1971) states that the slowest 10% of the learners may need 5 to 6 times as much time to learn as the fastest 10%. Several studies done by Block (1971), Arlin (1973), and Anderson (1976) demonstrate that when slower students are provided with extra time and further instruction on early units, the variance of time needed for the mastery of the later learning tasks will decrease. In a study done by Anderson (1973), Mastery and non-Mastery students are compared in terms of their learning rate on their final task. It was found that nonmastery students required more than twice as much time to reach the pre-set criterion level than the Mastery students on the final learning task.

According to Husen (1972), Sanderson (1976), Berliner (1979), and Smith (1979), if adequate learning time is not given or if the students do not spend a sufficient amount of time in learning, the degree of learning will be low.

In Bloom's instructional theory, there are three important determinants which affect school learning. The two student characteristics in the degree of learning are stated as entry behaviors: Bloom (1971) states that some of the

previous history of the learner, both academically and effectively, determines the learning outcomes of the learner. Bloom further adds that if the learner lacks the essential entry behaviors or motivation when entering a new learning task, it is not possible for him/her to adequately learn the learning task. According to Bloom, one of the important entry behaviors is Cognitive Entry Behaviors which he explains as "those prerequisite type of knowledge, skills and competencies which are essential to the learning of a particular new task or set of tasks" (Bloom, 1976, p.32). Bloom (1976) states that Cognitive Entry Behaviors account for 50% of the variance in achievement. Payne (1963), Bracht and Hopkins (1972) also mention that the variation among the learners will decrease if they all enter a learning task with similar prerequisites. Both micro and macro level studies demonstrate that there is a strong relationship between the Cognitive Entry Behaviors of a learner and his/her achievement in subsequent courses or learning tasks (Bloom, 1976). Bloom estimated that Cognitive Entry Behaviors account for up to one-half (r=+.70) of the variance on relevant cognitive achievement measures over subsequent learning tasks.

The other entry behavior which Bloom calls as Affective Entry Characteristics of the learner is considered "as a complex compound of interests, attitudes and self-views" (Bloom, 1976, p.75). Carroll (1963) defines motivation for a task in terms of the perseverance the

learner brings to the task, that is the effort he/she is willing to make to accomplish the task to a criterion level. Bloom (1976) states that Affective Entry Characteristics account for 25% of the variation in achievement (r=+.50).

Studies done by Block (1976), Arlin (1973), Anderson (1973), and Özçelik (1974) indicate that interest in the subject area increased over short periods of time for the mastery group whereas the interest in the subject remained the same or decreased for the non-mastery group. The two groups differ in terms of affect toward the subject, while one experiences successful achievement, the other group remains the same or decreases in achievement. This in turn affects their further achievement. All of the above mentioned studies demonstrate that achievement and subject affect are interrelated. Thus, high achievement increases positive affect, which in turn influences further high achievement, whereas low achievement decreases positive affect, which in turn depresses further achievement.

Bloom (1976) states that academic self concept is the student's perception of himself/herself in relation to other students' achievement in his/her class. Kifer's (1973) study demonstrates that academic self-concept is affected by the number of years the students experiences success or failure in school. This is basically in relation to extreme learners. As Kifer pointed out, academic self-concept is very much influenced by school achievement. 25% of the

variance in school achievement is accounted for by academic self-concept after the elementary school years. Bloom estimated that Effective Entry Characteristics explain one fourth (r=+.50) of the variance on relevant cognitive achievement measures.

Another crucial determinant which affects school learning is the Quality of Instruction. Feedback and correctives are the most important part of Quality of Instruction which also includes (cues, participation and reinforcement as the other subvariables. According to Bloom (1976), if instruction consists of systematic feedback and correctives, students can reach high levels of learning. Bloom (1976) also mentions that if errors during a learning unit are corrected before compounding in later units, then almost all of the students will attain mastery. Thus, through a feedback and corrective system, error correction becomes inevitable in the application of Mastery Learning Method of Instruction. In addition to feedback and corrective procedures, Bloom (1976) states that "Quality of Instruction has to do with the cues or directions provided to the learner in learning activity (covert or overt), and reinforcement which the learner secures in some relation to learning" (Bloom, 1976, p.115).

In research done by Block (1971, 1974), control and mastery learning classes are compared in regard to achievement outcomes at the end of the course. The major

difference between these two classes taught by the same instructor were the feedback and corrective techniques. The feedback procedures are comprised of brief formative tests which are diagnostic in nature and are given at the end of each learning task indicating what the student has learnt and what he/she further needs to learn. Correctives are the suggestions given to each student as to what he/she needs to go over and emphasize in the original instructional material. In this study, Block found that the average student obtained up to 90% of the possible score on the formative test for each learning task in the mastery class, whereas the average student in the control class obtained only 50% of the possible score (Afreşa 1983, Nwabueze 1984, Eğinlioğlu 1985, Sayar 1986).

In the studies done at the University of Chicago by Block (1970), Arlin (1973), Anderson (1973), Binor (1974), Levin (1975), and Pillet (1975), the effects of quality of instruction on the final critical learning task and on the summative achievement measures is observed. Quality of instruction is the use of feedback and correctives in all of the above mentioned studies. On the first formative test before feedback and conectives, the median correlation between quality of instruction and achievement is +.19. At the end of the second learning task, the median correlation between quality of instruction and achievement is +.35, while it is found as +.47 at the end of the third learning task and +.53 on the final summative

achievement measures. The major difference in Quality of Instruction in these studies is that the Mastery students were given feedback and correctives after each learning task whereas the control class is not given any systematic feedback and correctives. As a result of feedback and corrective procedures provided to the mastery group at the end of three learning tasks, the difference between mastery and control classes is increased favoring the Mastery group, while at the beginning, the two groups are approximately equal. Bloom estimated that Quality of Instruction can account for at least one-fourth of the variance on relevant cognitive achievement measures.

The studies done by Mayo and Longo (1966), Lee et al.(1971), Kersh (1971), Jones et al.(1975) and Pillet (1975) show that the variance in achievement of the Mastery Learning group on the summative test is decreased in contrast to the control group as a result of additional time and help given at the end of the formative tests for each learning task for the group which is instructed under Mastery Learning Method of Instruction.

According to Bloom (1976), if all learnershave the necessary prerequisites for a new learning task, and if the Quality of Instruction is appropriate to their needs, then all the students will learn the task adequately. Bloom (1976) further adds that when cognitive entry behaviors, affective entry characteristics and quality of instruction

are combined, these three variables account, for more than 90% of the variation in level of achievement or in the rate of achievement.

Yıldıran (1977) tested the effects of high levels of achievement on other learning criteria. She found that level of achievement affects retention, transfer, and the use of higher mental processes. Research demonstrates that retention, transfer, higher and lower mental processes and effective outcomes are influenced by the level of learning not as was thought before by the rate of learning, aptitude, IQ or time-related effort. She also mentions that students will be successful on other learning criteria if they learn the given material adequately through the implementation of Mastery Learning Method of Instruction.

Another study done by Durnin and Yıldıran (1987) investigated the effects of combining Mastery Learning techniques with teaching for creativity in learning a second language. According to the findings of the study, the group that received both treatments, namely Mastery Learning and teaching for creativity methods, scored significantly higher than the controls. The important finding of this study is that mastery of the content enhances one's performance on creative tasks as it can be seen from the results obtained by the Mastery Learning only group on the creative and transfer tasks. In addition to this, when instruction is focused on the use of higher mental processes, this helps

learning on lower mental processes although they are not emphasized during teaching as illustrated by the results of creativity only group in content learning.

Research done until now indicates that Mastery Learning Method of Instruction increases level of achievement in learning about one standard deviation over the control class. However, educational researchers are now looking for other interventions which when added to Mastery Learning Method of Instruction increases achievement levels still further. Bloom calls this issue as the "2 sigma problem" and states that "In our own attempts to solve 2 sigma problem, we assume that two or three alterable variables used together contribute more to learning than any one of them alone" (Bloom, 1984, p.7). He adds that the feedback and corrective system in the Mastery Learning strategy produces 1 sigma effect, and the researchers now are in search for other variables, which when added to Mastery Learning might approach the 2 sigma effect. These variables include improving student processing, improving teaching, improving the instructional materials and changing the home environment (Bloom, 1984). The studies done in the past show that the more the students possess the cognitive entry behaviors for each new learning task, the better they learn the new task, the more positive they are in their ability to learn the subject and the more learning time they put in active learning. The important thing to note here is

that under Mastery Learning strategy, the learners improve their "processing" of instruction (Bloom, 1986).

There are some research done in relation to the provision of cognitive prerequisites in addition to the implementation of Mastery Learning Method of Instruction both in the States and in Turkey. Leyton (1983) states that in addition to Mastery Learning Method of Instruction during an advanced course in a sequence, the students might be furnished with cognitive entry prerequisites at the beginning of a new course. According to her findings, the group of students that are provided with Cognitive Entry Behaviors in addition to Mastery Learning, in other words, the group under both treatments, was approximately 1.6 sigmas above the control group on the summative test. The average experimental student ranked above 95% of the students in the control group on this test.

Another study done by Sayar (1986) shows that the combined effect of Mastery Learning Method of Instruction in addition to the provision of Cognitive Entry Behaviors produces higher achievement levels than those obtained through Mastery Learning or Cognitive Entry Behaviors alone. She found that the combined effects of Mastery Learning and Cognitive Entry Behaviors lead to achievement levels which are 2.76 standard deviations over the control class. Mastery Learning alone leads to levels of achievement which are about 1.76 standard deviations above the mean over the

control class. The provision of Cognitive Entry Behaviors alone produces achievement levels which are about .73 standard deviations over the control class.

Finally, a study done by Senemoğlu (1987) investigated the effects of remedial teaching on cognitive entry behaviors and feedback correctives on achievement levels. Her findings suggest that the two groups which are experimental, namely the group provided with remedial teaching or Cognitive Entry Behaviors, and the group provided with remedial teaching in addition to feedback and corrective systems score significantly higher than the control group. Moreover, the group receiving both treatments scores significantly higher than the group under the single effect of remedial teaching.

Observation of teacher interaction with students in the classroom show that teachers frequently direct their teaching and explanations to some students and ignore others. Moreover, they give much positive reinforcement and encouragement to some and not to others.

Research done demonstrates that the students in the top third of the class are given the greatest attention whereas the students in the bottom third of the class receive the least attention and support. Thus, these differences in relation to the interaction between teachers and students provide some students with much greater opportunity and encouragement for learning than for others

(Brophy and Good, 1970). As Bloom (1984) states "In some of our research on the 2 sigma problem, we have viewed the task of teaching as providing more equal treatment of students and have therefore been trying to give teachers feedback on their differential treatment of students" (Bloom, 1984, p.12).

A study done by Nordin (1979) tested the effects of improved teaching. He found ways of improving the cues and explanations for students as well as increasing active participation. He met frequently with teachers explaining them ideas and observed and helped them determine what they needed in order to improve their qualities of instruction. He compared students learning under conventional instruction, under mastery learning and under enhanced cues (explanation), and participation conditions. His results show that the average student in terms of final achievement in the enhanced cue and participation group was about 1.5 sigmas higher than the average student in the control group. According to the results, Mastery Learning procedures worked even better than the enhanced cues and participation procedures. However, Nordin did not use mastery learning in combination with entranced cues and participation.

In a later study done by Tenenbaum (1982), the control group, mastery learning group and mastery learning in combination with enhanced cues, participation and reinforcement group were compared. The results of this

research showed that there were large differences between the three groups in terms of methods of instruction as can be seen from the final achievement scores. The group instructed under Mastery Learning in addition to enhanced cues, participation and reinforcement scored 1.7 sigmas above the control group. The group instructed under Mastery Learning alone scored 1 sigma above the control group. Another important findings of this study is that the cue-participation-reinforcement + Mastery Learning group was again 1.7 sigmas higher than the control group on the higher mental process part of the summative test. Thus, as the results suggest, most students can learn the higher mental processes if they become more central in the teaching-learning process (Bloom, 1984).

A study done by Soled (1986) about improving the teaching of higher mental processes which emphasized problem solving, application of principles, analytical skills and creativity indicated that when more time and emphasis was put on teaching processes, there was a corresponding gain in both higher as well as lower mental processes (Bloom, 1986). In her study, there were four groups. One group was under conventional teaching with major emphasis on lower mental processes. For the second group, the teacher had one third of the questions emphasize higher mental processes (HMP) with the remaining two-thirds emphasizing lower mental processes. In this group, the average student not only scored above 79% of the control students in terms of the

higher mental process questions but also above 76% of the control group on the lower mental processes. In the third group one-third of the instructional material as well as one third of the mastery learning formative and summative test questions emphasized higher mental processes. In this group the average student was above 88% of the control group on the higher mental processes and 84% on the lower mental processes. Finally, in the fourth group, one-third of the teacher questions, one-third of the mastery learning formative and summative test questions and one-third of the instructional materials emphasized higher mental processes. In this group, the average student scored above 96% of the control students on the higher mental process questions, and above 93% of the control group on the lower mental processes. As the findings suggest, emphasis on higher mental processes during instruction helps the students' performance in lower mental processes as well.

There are also some studies done in Turkey in relation to Improved Teaching. Afreşa (1983) investigated whether Mastery Learning which enables a majority of students reach high levels of learning also enables them to retain better the material learned in comparison to students under normal school conditions. Her findings suggest that the achievement levels of the class instructed under Mastery Learning Method of Instruction is significantly higher the control class. In addition to this, the retention scores of the Mastery Learning students are again significantly higher

than the control group. As the findings demonstrate, there is a difference of 2.2 standard deviations between the mean performances of the Mastery Learning and control groups on the summative test scores. Similarly, there is again a difference of 2.1 standard deviations between the mean performances of the Mastery Learning and control groups on retention measures. In her study Improved Teaching which was defined as the training of the teacher implementing this strategy on both the theory and method of learning as well as its application to classroom environment was also utilized. Thus, a difference of approximately 2 standard deviations favoring the Mastery Learning group can be attributed to Improved Teaching which was an intervention within the Mastery Learning itself. As Yıldıran states according to Bloom "There are other intervention which when added to Mastery Learning raise the level of learning to 2 standard deviations above the mean of the control class" (Yıldıran, 1985, p.115-116).

Another study done by Nwabueze (1984) investigated the effects of Mastery Learning in addition to Improved Teaching on achievement in comparison to the effect of Mastery Learning alone. In Nwabueze's study, improved teaching was defined as giving the teacher feedback in terms of his/her interactions with different groups of students. Nwabueze implemented his study into four classes which were Mastery Learning combined with Improved Teaching class, Mastery Learning Class, Improved Teaching Class and the

control class. His findings show that the class instructed under Mastery Learning Method of Instruction combined with Improved Teaching was not only higher than the control class but also significantly higher than the Mastery and Improved Teaching Classes. In addition, the effects of both interventions were additive.

Ausubel (1960) proposed that learning material might be improved by giving the students a brief introduction or overview of the ideas to be developed in each new chapter or learning task providing students with the objectives, or some ideas about what will be learned in the chapter would enhance learning. According to Ausebel, the main purpose of these advance organizers is to relate what the students already know to what they need to know before entering a new learning task (Bloom, 1986). Since that time, there have been some studies in relation to the effectiveness of advance organizers. Avalos (1986) states that advance organizers should be provided at the beginning of a new unit or a chapter, intermmediate organizers at the middle of the unit or chapter and post organizers at the end of the chapter. According to his findings, when such organizers were used in a mathematics course, the average student ranked about 79% of the students who were not provided with organizers. Avolos's study is still in process and now he is investigating the effects of organizational aids in the instructional material with the provision of cognitive prerequisites and the mastery learning feedback

and corrective procedures. He is trying to determine the separate effects of each of the three processes, the effect of any two of the interventions and finally the combined effect of all three interventions (Bloom, 1986).

The study done by Eğinlioğlu (1985) indicates that the effect of Mastery Learning Method of Instruction used in combination with Improved Materials raises achievement levels even further than what Mastery Learning does alone. Improved Materials in this study was defined as clear objectives for each learning task studied, a table of specifications relating the content to the objectives as well as formative and summative evaluation instruments derived directly from these objectives. Eğinlioğlu states that Mastery Learning generally produces a difference of about one standard deviation over the control class while two interventions used in combination with one another raise the difference to over 1.5 standard deviations in comparison to control classes.

Research shows that home environment has a great impact on the student's school learning which is especially effective at the elementary school level or earlier. Studies that have focused on the home environment processes that affect learning find correlations of +.70 to +.80 between an index of the home environment processes and the children's school achievement. These home environment processes include work habits of the family, academic guidance and support,

stimulation, language development and academic aspirations and expectations (Bloom, 1984). As Bloom states in his article "The Search for Methods of Group Instruction as Effective as One-to-One Tutoring" (1986), there have been some suggestions as an approach to the 2 sigma problem of combining effective parent education with mastery learning. He adds that if these two interventions begin with the 1st or 2nd grade children, the combination will produce effective learning at least in the elementary school years (Bloom, 1984).

Since the present study aims to investigate the combined effects of Mastery Learning Method of Instruction and Private University Preparatory Institution attendance on measures related to school achievement as well as on measures related to university entrance examination, it would be useful to review the historical backgrounds of the Student Selection and Placement Examination (ÖSYS) and Private University Preparatory Institutions in Turkey.

Today senior high schools, namely lycées do not have any other function than preparing students to higher education institutions. Unfortunately, every lycée graduate can not enter a higher education institution due to the scarcity of these institutions, their limited quotas and the increasing demand of applicants each year. As Doğramacı states in his book called 1981 Higher Education Reformation and Six Years Application Results (1981 Yükseköğretim

Reformu ve Altı Yıllık Uygulama Sonuçları) (1988) in the academic year of 1987-1988, there are 29 universities, 210 faculties (fakülte), 167 higher education institutions (yüksekokullar), and 110 institutes offering graduate and post-graduate programs (yüksek lisans ve doktora eğitiminden sorumlu enstitüler) in Turkey. The following table gives the number of junior high schools (orta okullar), senior high schools (liseler), vocational/technical high schools (mesleki ve teknik okullar) and the number of students for each type of school in the academic year of 1986-1987.

TABLE 1. Junior High Schools (orta okullar), Senior High Schools (liseler), Vocational and Technical High Schools (mesleki, teknik okullar) and Student Numbers in Each Type of School in the Academic Year of 1986-1987.*

TYPE OF SCHOOL	NUMBER OF SCHOOLS	NUMBER OF STUDENTS	GRADUATES
Junior high schools (orta okul)	5445	1.962.942	360.386
Senior high schools (liseler)	1346	672.670	132.756
Junior high school level vocational/ technical schools (orta seviyeli mesleki ve teknik okullar)	692	201.148	34.745
High school level vocational/technical schools (Lise seviyeli mesleki ve teknik okullar)	1440	465.171	93.956

* This table is taken exactly from Statistical Yearbook of Turkey (Türkiye İstatistik Yıllığı: 1987). Başbakanlık Devlet İstatistik Enstitüsü Matbaası: Ankara, 1988, Publication No.1250, p.118.

Although there are many graduates who are eligible for admission to higher education programs, these institutions can admit a limited number of students each year. Since only a certain number of candidates can be accepted to higher education institutions, the question as to how these applicants will be selected and placed in the available institutions comes up. As Özçelik states "With the exception of very few institutions for which special talents are required, all institutions of higher education in Turkey accept students in accordance with the results of the examination organized by the Student Selection and Placement Center (ÖSYM). Students are selected for and placed in higher education institutions according to their scores in the selection and placement examination, their high school grade-point averages, their personal preferences about areas of higher learning, and the quotas and prerequisites of the areas of higher learning on their lists of personal preferences" (Özçelik, 1988, p.1).

The Student Selection and Placement Examination (ÖSYS) consists of two steps held with a two-month interval each year. All eligible candidates take the first stage of the examination which is known as the Student Selection Examination (Öğrenci Seçme Sınavı, ÖSS). The number of candidates taking the first stage of the examination for the 1986-1987 academic year was 616.889. According to the results obtained from the first stage of the examination as well as high school grade-point averages, candidates are

called for the second stage of the examination. The number of students taking the second stage of the examination was 230.000 for the same academic year. Almost 1/2 of the candidates who take the Student Placement Examination (Öğrenci Yerleştirme Sınavı, ÖYS) in other words, the second stage of the examination are placed in a faculty or a higher education institution. Decisions about placement depends largely on the results of the Student Placement Examination (Öğrenci Yerleştirme Sınavı, ÖYS), namely the second stage according to the candidates preferred areas of study. For the academic year of 1986-1987, the number of students who were placed in universities was 40.000, another 73.817 were placed in the Open University (Açık Öğretim), totalling to 113.817 students. In short, at this academic year 6.4% of the candidates were placed in universities and 11.96% were placed in the Open University, totalling to 18% out of 616.889 candidates who went through the first stage of the examination (Özçelik, 1988).

Historical Background of the Student Selection and Placement Examination (OSYS)

Information about the historical background of the Student Selection and Placement Examination are taken Payaslıoğlu's Student Selection and Placement System For Higher Education Institutions in Turkey (Türkiye'de Yükseköğretim Kurumlarına Öğrenci Seçme ve Yerleştirme Sistemi, 1985).

Until 1956, there was no selection system for faculties and other higher education institutions, except for İstanbul Technical University (İstanbul Teknik Üniversitesi) formerly Higher Engineering School (Yüksek Mühendis Mektebi) and Faculty of Political Science (Siyasal Bilgiler Fakültesi) formerly known as School of Political Sciences (Siyasal Bilgiler Okulu). During this period, those students who had their lycée diplomas and matriculation exams were accepted to higher education institutions they want to study without going through any enterance examinations.

After 1950's, the growing increase in demand for higher education caused universities to face an important problem, namely the issue of capacity. Therefore, some faculties and higher education institutions began to offer selection examinations which in turn brought its problems along. Candidates taking the exams several times,

inconsistencies in the evaluation of the exams given by different institutions, problems of validity and reliability, wastage in economical terms were among the issues which required some preventions and new organizations.

In 1962, the Ankara University offered an University Entrance Exam (Üniversite Giriş Sınavı) for all of its faculties, and this system was put into practice the following year.

In December 1963, a Centralized System (Merkezi Sistem) for admission to higher education institutions was approved by the Interuniversity Commission (Üniversitelerarası Kurul) which was implemented in 1964. This system aimed to select the candidates by a centralized university examination, and would be offered at a certain designated time of the year. However, being a part of this Centralized System was left to the decision and preference of the particular higher education institution. This Centralized System was under the responsibility and supervision of different universities at different years in the following order: The Ankara University in the academic years of 1964-1967, The İstanbul University in the academic years of 1967-1973, and The Hacettepe University in 1974. Although the number of institutions participated in this Centralized System increased by time, because participation was voluntary and the system was not appropriate to solve

the problems faced in selection and placement of the university candidates, the difficulties and problems concerning this issue continued.

In 1974, Interuniversity Commission (Üniversitelerarası Kurul) passed a regulation in order to centralize all of the university entrance examinations for admission to higher education institutions. By this regulation, a Student Selection and Placement Center (Öğrenci Seçme ve Yerleştirme Merkezi, ÖSYM) was founded in November 1974. The Administrative Council (Yönetim Kurulu) of this center prepared and organized the Interuniversity Selection Examination (Üniversitelerarası Seçme Sınavı, ÜSS) in 1975. The Interuniversity Selection Examination was a one stage process until 1981. However since the year of 1981, this Center started to apply a two-stage examination for university admissions. From the same year on, candidates who have completed their senior high school education as honor students began to take university entrance examinations from a special quota. Also from 1981 on, a special examination was started for foreign students, called the Foreign Student Examination (Yabancı Öğrenci Sınavı, YÖS). By the year of 1982, students' previous success, G.P.A. of their high school grades was included as a variable in the computation of their overall Student Selection Examination (Öğrenci Seçme Sınavı, ÖSS) and Student Placement Examination (Öğrenci Yerleştirme Sınavı, ÖYS) scores. By 1984, graduates of vocational and technical schools were given extra credit

to be added to their scores if they planned to enter in a higher education program related to their previous education (Payaslıoğlu, 1985, p.9-11).

Student Selection and Placement Examination (ÖSYS)

Every year the number of students to be admitted to higher education institutions, admission requirements for the programs, and the quotas of these institutions are determined beforehand.

The Selection and Placement Examination (ÖSYS) is given once a year and is administered in two stages. The first stage is called as the Student Selection Examination (Öğrenci Seçme Sınavı, ÖSS). All eligible candidates are invited to the first stage of the examination. According to the results of the first stage and high school-grade-point averages' applicants are accepted to the second stage of the examination which is known as the Student Placement Examination (Öğrenci Yerleştirme Sınavı, ÖYS). Approximately one half of the finalists who take the second stage of the examination are placed in a faculty or a higher education institution. As Özçelik states "Decisions for final selection and placement are based largely on the results of the second stage. Those who are successful on the second stage of the examination are placed into programs of higher learning indicated by their preferred areas of study"

(Özçelik, 1988, p.1). It is important to note at this point that the applicant's ordered personal preferences should not exceed twenty-four.

The main purpose of the first stage of the examination where a two-test battery is utilized is selection. As Özçelik states in his article on Admission to Higher Education "One test measures the candidates verbal ability, and the other measures their quantitative abilities. The verbal test measures proficiency in Turkish and the ability to reason using social-science concepts and generalizations. The quantitative test measures basic concepts and rules of mathematics and the ability to reason using natural-science concepts and generalizations" (Özçelik, 1988, p.2).

The scoring for the first stage examination is as follows: Each students verbal and quantitative test scores are transformed to standard T-scores. Moreover, his/her grade-point average is also transformed to a standard T-score. The reason for this practice is to prevent the difficulties that may arise due to the different grading system each high school has. Selection for the second stage of the examination is done according to the weighted sum of transformed scores where the weight of 1 is utilized for each of the transformed scores for the verbal and quantitative tests, and the weight of 0.25 is applied to the transformed high school grade-point average. Lastly, a

summary for each student is obtained by calculating a weighted sum of these three measures, namely verbal and quantitative tests and grade-point averages.

The second stage of the examination which is called the Student Placement Examination (Öğrenci Yerleştirme Sınavı, ÖYS) has two objectives; selection and placement. On this examination, a five-battery test is used which include Mathematics, Natural Sciences, Turkish Language and Literature, Social Sciences and a Foreign Language. High school physics, chemistry and biology subject areas are included in the Natural Sciences Test. Likewise, high school history, geography, sociology, psychology and philosophy are included in the Social Sciences Test. In the language test, English, Germen and French are the three alternative languages. All of these tests are believed to measure the students' prior learnings in high schools and also to possess the necessary Cognitive Entry Behaviors for higher education in related subject areas.

The scoring of the second stage of the examination is quite similar to the first stage. First, each candidates scores on the 5 tests are transformed to standard T-scores. Then, seven differentially weighted sums are calculated for each candidate which constitute the basis for final selection and placement. Table 2 gives the weighted sums used in decisions of final selection and placement.

ABLE 2. The Weighted Sums Used in Decisions of Final Selection and Placement**

Weighted Sum:		COMPONENTS AND THEIR WEIGHTS (IN PERCENTAGES):						
e of the eighted sum:	The fields of higher learning for which it is a predictor	High School Grade-Point Average: *	Test Scores For The Second Stage: Turkish Lang.&Lit:	Mathematics	Natural Sciences	Social Sciences	Foreign Language	Weighted Sums for the First Stage
atural ciences	Natural sciences including medicine	10	8	20	50	2	2	8
athematics nd Natural ciences	All branches of engineering	10	8	35	35	2	2	8
ocial Sciences	Social Sciences	10	20	5	5	50	2	8
urkish and ocial ciences	Journalism, Dramatic Arts	10	35	2	2	35	8	8
urkish and athematics	Info sciences, communication	10	35	35	5	5	2	8
oreign anguage	Foreign Languages (French,German, Inglish)	10	20	2	2	8	50	8
urkish, ath.,Soc.& at.Sci.	Multi-disciplinary areas (specific prerequisites not known)	10	20	20	20	20	2	8

This weight is reduced to 5 for those who are applying for readmission, and raised to 15 for those vocational high school graduates applying for a program which is direct continuation of their earlier training. Adapted from OSYM (1986, s:30).

This Table is taken exactly from Özçelik's Article on Admission To Higher Education. 1988.

Decisions about final selection and placement of the candidates are made according to the following criteria: the candidate's weighted sum on the Student Selection Examination (Öğrenci Seçme Sınavı, ÖSS), his/her weighted sums on the tests included in the Student Placement Examination (Öğrenci Yerleştirme Sınavı, ÖYS), his/her grade-point average, his/her personal preferences, and the quotas and prerequisites of the higher education programs.

There are some changes that are implemented for the Student Selection and Placement Examination (ÖSYS) in 1987. For the first stage of the examination, a foreign language test in addition to verbal and quantitative tests are included in the Student Selection Examination (Öğrenci Seçme Sınavı, ÖSS) Although T-score transformations are calculated for the foreign language test, this score is not added to the score obtained on the verbal and quantitative tests. This test only serves for the purpose of determining the candidate's level of foreign language.

The programs of higher education institutions which admit candidates according to the results of the second stage of the examination are divided into three main groups in terms of the Student Placement Examination (Öğrenci Yerleştirme Sınavı, ÖYS) scores that are used for selection and placement and the tests that are utilized in the calculation of these scores. Table 3 gives the three

main groups and the related tests for each group that are required for admission to higher education institutions. These tests are natural sciences, mathematics, Turkish Language and Literature, social sciences and foreign language.

TABLE 3. Three Main Groups and the Related Tests for Each Group*

Natural Sciences and Engineering	Economical and Social Sciences	Humanities
a)Natural Sciences Test	a)Mathematics Test	a)Turkish Language and Literature Test
b)Mathematics Test	b)Turkish Language and Literature Test	b)Social Sciences Test
c)Turkish Language and Literature Test	c)Social Sciences Test	c)Foreign Language Test

* Adapted from ÖSYM (The Student Selection and Placement Center), 1987 Öğrenci Seçme ve Yerleştirme Sınavı: Kılavuz 2 (The Student Selection and Placement Examination of the Year 1987: Guide 2), Ankara, 1987.

A candidate who has made his/her personal preferences for higher education programs of a certain group, is only required to do the tests related to that particular group on the Student Placement Examination ((Öğrenci Yerleştirme Sınavı, ÖYS). For example, if a candidate has made his/her personal preferences for Natural

Sciences and Engineering group, then he/she is only responsible for the Natural Sciences, Mathematics and Turkish Language and Literature Tests. However, if preferences of higher education programs from two different main groups are made, the candidate has to complete the tests that are required by two different groups. It is inevitable that a candidate who has made his/her personal preferences from a single group will be more advantageous than a candidate who has made his/her preferences from two different groups, because the time alotted for both of the candidates are the same. In other words, the former candidate will do three tests, whereas the latter will have to do four or five tests according to his/her preference during the same period of time.

Table 4 gives the standard scores which constitute the weighted Student Placement Examination (Öğrenci Yerleştirme Sınavı, ÖYS) scores for placement and the coefficients used in the calculation of weighted scores.

TABLE 4. Standard Scores Which Constitute the Weighted Student Placement Examination (Öğrenci Yerleştirme Sınavı, ÖYS) Scores for Selection and Placement and the Coefficients Used in the Calculation of Weighted Scores.

Preferred Area of Study		Weighted ÖYS Scores	Turkish Lang&Lit. Standard Score	Mathematics Standard Score	Natural Sciences Standard Score	Social Sciences Standard Score	Foreign Language Standard Score	High-School Grade-Point Average*
MAIN GROUP	SUB GROUP							
A. NATURAL SCIENCES AND ENGINEERING	1. Natural Sciences	1. Natural Sciences Weighted ÖYS scores (F)	1.3	1.9	3.1	-	-	0.7
	2. Engineering Sciences	2. Mathematics weighted ÖYS scores (M)	1.3	3.1	1.9	-	-	0.7
B. ECONOMICAL AND SOCIAL SCIENCES	1. Economical Sciences	3. Turkish Lang&Lit. and Mat. weighted ÖYS scores (TM)	2.5	2.5	-	1.3	-	0.7
	2. Social Sciences	4. Social Sciences weighted ÖYS scores (S)	1.9	1.3	-	3.1	-	0.7
C. HUMANITIES	1. Language and History	5. Turkish Lang&Lit. and Social Sciences weighted ÖYS scores (TS)	2.5	-	-	2.5	1.3	0.7
	2. Modernges Languages	6. Foreign Lang. weighted ÖYS scores (D)	1.3	-	-	1.3	3.7	0.7

This table is adapted from ÖSYM (The Student Selection and Placement Center), 1987 Öğrenci Seçme ve Yerleştirme Sınavı: Kılavuz 1 (The Student Selection and Placement Examination of the Year 1987: Guide 1), Ankara, 1987.

Another change implemented within the system is that the Student Selection Examination (Öğrenci Seçme Sınavı, ÖSS) is no longer used as an examination for only selection purposes but it also serves to place the candidates in some of the higher education programs and institutions such as Technical and Vocational Teaching Programs (Teknik ve Mesleki Öğretmenlik Programları), Teaching Colleges (Eğitim Yüksek Okulları), and Open University (Açık Öğretim Fakültesi). Finally, the number of questions in the Student Placement Examination (Öğrenci Yerleştirme Sınavı, ÖYS) is increased in the rate of 30-40%.

As Özçelik states in his article "The basic purpose in this process is to place a candidate in the higher education program highest in his/her list of preferences compatible with his/her scores" (Özçelik, 1988, p.9).

The Selection and Placement Examination (Öğrenci Seçme ve Yerleştirme Sınavı, ÖSYS) seems to be the only solution for admission to higher education institutions since it tries to relate the skills that are taught in high schools with the necessary prerequisites for higher learning

required by the faculties or other higher education institutions for an increasing number of applicants each year. However, two important issues come up concerning the student Selection and Placement Examination (Öğrenci Seçme ve Yerleştirme Sınavı, ÖSYS). As Özçelik also states in his article about higher education, the first issue is the degree of correspondence between the content of ÖSYS and the skills taught in high schools, and the second issue is how much of the measures obtained in ÖSYS predicts the levels of achievement in higher learning.

In a study done by Oral (1985), the correlations between the high school grade-point average and a weighted sum of the ÖSYS test scores were found to range from 0.51 to 0.70. As the findings suggest, there is a close correspondence between the high school grades and ÖSYS test scores.

In another study done by Aşkar (1985) on the predictive validity of ÖSYS, the correlation between ÖSYS test scores and the grades received in freshman courses were found to be .62, for Electrical Engineering and .63 for Mechanical and Civil Engineering. On the other hand, the correlations Medicine, Agriculture and other basic sciences were computed as .37, .43 and .53, respectively. Finally, the correlation between ÖSYS test scores and grades received in freshmen courses was calculated as approximately .64 for Foreign Languages and Literatures.

The next leading deals with the historical background of the Private University Preparatory Institutions. Some of the information on the historical background of the Private University Preparatory Institutions is based on an informal interview held with the director of Association of Private University Preparatory Institutions (Özel Dersaneler Birliği), İbrahim Arıkan in TUSSIDE (Turkish Industrial Directing and Administrative Institute-Türkiye Sanayi Sevk ve İdare Enstitüsü) during TUSSIDE Educational Seminar in Gebze on June, 27-30, 1988.

Historical Background of the Private University Preparatory Institutions

The highly selective system imposed by the Student Selection and Placement Examination (OSYS) and the increasing demand for higher education resulted in the emphasis for the need of Private University Preparatory Institutions.

The history of Private Educational Institutions (Özel Öğretim Kurumları) goes back to 1800's. According to the Constitution of 1876, the schooling system was under the supervision of the state, and abiding by this law was strictly required. As far as this law was concerned, there were three types of private schools (özel okullar) in effect

within the territories of the Ottoman Emphire. These were as follows:

1. The schools founded by the Moslem majority
2. The schools and institutions founded by Non-Moslem minority groups
3. The schools founded by missionaries

Although schools established by the name of minority groups and missionaries were not allowed to function according to the Private School By-Law (Mekâtibi Hususiye Talimatnamesi) of 1915, this article was annulled by the Sevr Treaty. With the laws and by-laws validated after the foundation of Turkish Republic in 1923, all the private schools including missionary and minority institutions were subsumed under the same administrative regulations and educational policies as public schools. It is important to mention that Private Preparatory Institutions (Özel dersaneler) gained their first legal status with the Private School By-Law (Mekâtibi Hususiye Talimatnamesi Özel Okullar Yönetmeliği) of 1915. Though the Private School By-Law (Mekâtibi Hususiye Talimatnamesi) was basically concerned with "Private Schools" (Özel Okullar), articles 1 and 16 were about Private Preparatory Institutions (Özel dersaneler). According to articles 1 and 16, Private Preparatory Institutions (Özel dersaneler) were conceived as "Private Schools" offering education in

science, language and art. Thus from the year of 1915 onwards, Private Preparatory Institutions (Özel dersaneler) have gained their legal status as Private Educational Institutions (Özel Öğretim Kurumları) (Private Preparatory Institutions in Education and Instruction (Eğitim ve Öğretimde Özel Dersaneler), 1987).

The law No. 2773 which was enacted in 1935 in regard to Private Educational Institutions (Özel Öğretim Kurumları) did not allow any private organization to operate without the legal permission of the government. It was by the same law that the school teachers were permitted to work in such organizations on part-time bases. In June 1965, a more elaborate and comprehensive law (No.625) concerning Private Educational Institutions (Özel Öğretim Kurumları) which invalidated Law No.2773 was passed(Private Preparatory Institutions in Education and Instruction (Eğitim ve Öğretimde Özel Dersaneler), 1987). The organizations which were under the heading of Private Educational Institutions (Özel Öğretim Kurumları) include Private Turkish Schools (Özel Türk Okulları), Minority Schools (Azınlık Okulları), Foreign Schools (Yabancı Okulları), Pre-School Centers (Anaokulları), Private Elementary (İlkokul) and Secondary Level Schools and their equivalents (Orta, Lise ve Dengi Okullar), Private Courses (Özel Kurslar), Private Preparatory Courses (Özel Dershaneler) both at the college and university levels,

Private Student Study and Education Centers (Özel Öğrenci Etüd Eğitim Merkezleri) and Private Sewing Courses (Özel Biçki-Dikiş Kursları).

The comprehensive legal statuses as well as the instructional and administrative policies of all of the above mentioned types of Private Educational Institutions (Özel Öğretim Kurumları) are entirely specified by the Law of Private Education Institutions (No.625) (Özel Öğretim Kurumları Kanunu) of June, 1965 even though some revisions and additions in relation to this law and its by-laws have been made after the year of 1982. Until 1982, Law No.625 was valid. Law No.2843 which revised Law No.625 (The Law of Private Education Institutions) was passed in June, 1983 stating that Private Preparatory Institutions were to be abolished one year right after this law was put in effect. However, the following year, in July, another Law (Law No.3035) was enacted to invalidate the decision of annulment. New by-laws, directiories and circularies are validated in compliance with Law No.3035 which provided the Private Preparatory Institutions (Özel dersaneler) with the opportunity to function, develop and gain their identities once more. Although this law promoted the development of all the Private Preparatory Institutions (Özel Dershaneler) and gave authorization to these institutions, all of them are strictly under the supervision of the government.

Today Private Preparatory Institutions (Özel dersaneler) operate on the bases of Private Preparatory Institutions Type By-law (Özel Dershaneler Tip Yönetmeliği) which is prepared by the Ministry of Education, Youth and Sports and pssed in March, 1985 (Yerli and Kırlı, 1986). According to article 4 of this by-law, objectives and functions of Private Preparatory Institutions (Özel dersaneler) are stated as;

a) to aid students with the courses they are not successful by providing them with remedial help and increase their level of knowledge

b) to prepare the students for the entrance examinations (ie college and university/higher education institutions) as well as for the final examinations for those who had left formal schooling but can graduate upon the successful completion of these exams (Okul dışından bitirme sınavları).

Educational Instructional and Administrative Operations of Private Preparatory Institutions

All of the information in regard to this heading is taken from Arıkan's (the director of the Association of (Private University Preparatory Institutions) article

published in the Journal of Private Preparatory Institutions in Education and Instruction (Eğitim ve Öğretimde Özel Dersaneler), 1987.

The operations of Private reparatory Institutions can be summarized under several headings:

1. Grouping students according to their levels

2. Methods of instruction

3. The teaching staff and its functions

4. The approach of the administrative body of Private Preparatory Institutions towards students

5. The quality and the objectives of the tests

6. The publications of Private Preparatory Institutions

a. Grouping of Students According to Their Levels

Students are grouped according to their levels before the academic year begins. This grouping system is based on several criteria: Some Private Preparatory Institutions offer an examination to determine the level of their students at the beginning of the academic year whereas others consider the success levels of students in their present senior high schools. On the other hand, some Private

Preparatory Institutions take the quality of instruction of the lycees into consideration and group their students according to the type of school they are coming from. Some other institutions group their students in relation to their interests. There are also other Private Preparatory Institutions where students are grouped with the combination of 2 or 3 criteria that are mentioned above. However, the main purpose is to group students according to their similar interests and levels of knowledge.

b. Methods of Instruction

According to article 32 of Private Preparatory Institutions Type By-law (Özel Dershaneler Tip Yönetmeliği), the duration of one class period is determined as 50 minutes. Therefore, at the beginning of the academic year, schedules and course plans for each subject area per semester are prepared in regard to curriculum programs. The content of the courses is divided into course hours and thus, the hours of instruction for each subject area are determined. Although the curricula of the Private Preparatory Institutions are the same as the curricula of the schools, there exist differences in the ways in which these courses are taught.

The target of instruction in Private Preparatory Institutions is mainly to coach students by exposing them to previously used tests. Private Preparatory Institutions

offer their courses in such a way that they tap the objectives and skills required by the entrance examinations as well as provide these skills to students. The most important function of Private Preparatory Institutions is that they teach students the techniques of test taking and appropriate use of their time in answering the questions. In addition to these, Private Preparatory Institutions give a great emphasis to thought-provoking processes, in other words, higher mental processes where application, analysis, synthesis, evaluation and interpretation gain importance. Rother than rote memorization of facts, principles and formulas, instruction is basically focused on the use and application of such concepts into new learning situations and conditions. The main objective is to teach students the basic concepts and rules as well as to teach them the ability to think and reason.

c. The Teaching Staff and Its Functions

It is important to note at this point that according to article 35 of Private Preparatory Institutions Type By-law (Özel Dershaneler Tip Yönetmeliği), the directors and teachers of Public Education Institutions (Resmi Öğretim Kurumları) are allowed to work as neither directors nor teachers in Private Preparatory Institutions (Özel Dershaneler). Eligible candidates who have teaching certificates, and who are not committed to any of the Public

Education Institutions can work as instructors in these organizations.

The teaching staff is under the strict supervision and control of first, the inspectors of the Ministry of Education, Youth and Sports and secondly, under the supervision of the director of the Private Institution in which he/she works. Because the salaries of the teachers are very satisfactory, most of the well-trained teachers prefer to work in Private Preparatory Institutions.

In the academic year of 1987-88, there were 12.000 instructors working in these institutions. The salaries of the teaching staff ranged between 300.000 TL. to 1.000.000 TL.

Students can easily direct their questions to the teachers and teaching learning processes mostly involve discussions. While the teacher presents the material to be learned, he/she introduces many original questions to provoke students' thinking.

Since there is no grading system imposed by the Private Preparatory Institutions, there are not any problems of failure and success. Teachers are not faced with very many disciplinary problems in Private Preparatory Institutions.

d. The Approach of the Administrative Body of Private Preparatory Institutions Towards Students

The success of any Private Preparatory Institutions is measured by students' achievement in College/Anadolu Lycée or University Entrance Examinations. Therefore, their main purpose is to increase the students' level of achievement on these examinations.

Although the administrative bodies implement commonly used educational and instructional techniques, they also try to develop new systems for their students. For example, guidance services are founded in some of the Private Preparatory Institutions. Through guidance services, the students are mainly provided with vocational guidance where they are assisted in developing an understanding of themselves, their talents and their interests as well as getting familiar with different occupations and available career opportunities.

Most important of all, students are helped in making their lists of personal preferences for entrance examinations. Moreover, guidance services help students recognize the problem of anxiety, determine their anxiety levels and teach them techniques in order to cope effectively with anxiety.

Finally, guidance services are concerned with the learning process of students. They organize programs in which students are taught effective study skills.

e. The Quality and the Objectives of the Tests

The most important function of Private Preparatory Institutions is that they coach students by exposing them to many tests through which students are taught test taking techniques. Since objective tests are not commonly used as a means of examination by traditional high schools, the students are acquainted with neither tests nor test techniques. On the other hand, all of the entrance examinations for colleges/Anadolu Lycées and universities are done on the basis of objective tests. Thus, Private Preparatory Institutions (Özel dersaneler) expose students to objective tests and test techniques. Moreover, on certain dates during the year, these institutions offer trial (deneme) tests which are administered in a similar way as entrance examinations. In this way, students are helped to measure their level of knowledge, to recognize their inadequate areas of learning, and most important of all, to develop realistic lists of personal preferences for the actual entrance examinations based on the results obtained on these trial tests.

f. The Publications of Private Preparatory Institutions

Tests are developed by Testing Bureaus of Private Preparatory Institutions or by the teachers who work in these organizations. Test books that are published provide the best possible resource for all the students preparing for any kind of entrance examinations as well as for those who can not attend such institutions.

Some recent statistical information about Private University Preparatory Institutions will be presented under the next heading.

Private University Preparatory Institutions

Today, the highly selective system imposed by the Student Selection and Placement Examination (ÖSYS), the increasing demand for higher education, the limited quotas of universities and higher education institutions and differences in the quality of instruction among senior high schools, namely lycées lead thousands of students to attend Private University Preparatory Institutions.

In the academic year of 1986-87, there were 535 Private University Preparatory Institutions (Özel dersaneler). The following table gives the distribution of Private University Preparatory Institutions according to cities in Turkey.

TABLE 5. The Distribution of Private University Preparatory Institutions According to the Cities in Turkey*

Adana	39	Çankırı	-	İzmir	23	Ordu	4
Adıyaman	1	Çorum	3	Kars	1	Rize	5
Afyon	4	Denizli	4	Kastamonu	1	Sakarya	8
Ağrı	1	Diyarbakır	8	Kayseri	8	Samsun	8
Amasya	3	Edirne	6	Kırklareli	3	Siirt	2
Ankara	70	Elazığ	6	Kırşehir	2	Sinop	1
Antalya	13	Erzincan	2	Kocaeli	14	Sivas	4
Artvin	1	Erzurum	3	Konya	18	Tekirdağ	5
Aydın	12	Eskişehir	10	Kütahya	4	Tokat	3
Balıkesir	11	Gaziantep	8	Malatya	7	Trabzon	9
Bilecik	-	Giresun	2	Manisa	7	Tunceli	2
Bingöl	-	Gümüşhane	1	Maraş	5	Şanlıurfa	2
Bitlis	-	Hakkari	-	Mardin	-	Uşak	2
Bolu	5	Hatay	7	Muğla	1	Van	1
Burdur	1	Isparta	5	Muş	-	Yozgat	1
Bursa	22	İçel	16	Nevşehir	1	Zonguldak	9
Çanakkale	1	İstanbul	104	Niğde	4	TOPLAM	535

* This table is taken from the Journal of Private Preparatory Institutions in Education and Instruction (Eğitim ve Öğretimde Özel Dersaneler). Istanbul: Publication of the Association of Private University Preparatory Institutions (Özel Dersaneler Birliği Yayın Organı), June 1987, No:1.

As it can be seen from Table 5, there are Private University Preparatory Institutions all over Turkey except for 7 cities which are mostly located in Eastern Anatolian and North Eastern Anatolian regions.

As the director of Association of the Private University Preparatory Institutions, İbrahim Arıkan stated in the interview held in TÜSSIDE, Gebze (Turkish Industrial Directing and Administrative Institute-Türkiye Sanayi Sevk ve İdare Enstitüsü) during the TÜSSIDE Educational Seminar, there are 656 Private University Preparatory Institutions in Turkey today except for 3 cities which are Bingöl, Bitlis and Muş for the academic year of 1987-1988. For the same academic year, out of 130.000 11th grade students in senior high schools, approximately 70% of them attended the Private University Preparatory Institutions. On the other hand, 15% of 9th and 10th grade students participated in these institutions for the 1987-1988 academic year. Furthermore, as Arikan stated, each academic year approximately 180.000 to 200.000 students attend the Private University Preparatory Institutions.

11th grade students attend these istitutions for 10 hours week on the weekends whereas students who could not succeed either on the first or second stage of the university entrance examination participate in the Private University Preparatory Institutions for 20 to 25 hours during the week.

The fees the students pay for these institutions differing from one city to another range between 300.000-700.000TL. per year.

The Association of the Private University Preparatory Institutions (Özel Dersaneler Birligi Dernegi)

ÖZ-DE-BIR is the abbreviated form of Özel Dersaneler Birliği Derneği (The Association of the Private University Preparatory Institutions). Private University Preparatory Institutions which occupy a significant place in the Turkish education system are institutionalized under the name of the Association of Private University Preparatory Institutions for the following objectives:

1. to provide a more qualified educational, instructional and administrative service.

2. to maintain their distinguished roles as educational institutions in the Turkish opinion.

3. to provide cooperation among existing Private University Preparatory Institutions so that the problems which are likely to occur can be dealt with.

4. to prevent the functioning of illegal Private University Preparatory Institutions.

The achievement of the above mentioned objectives made it obligatory for these organizations to unite under the some association. The main function of the association is to provide unity in the educational, instructional and administrative affairs, and to be a representative body for the Private University Preparatory Institutions in order to protect their rights and benefits against Public and Private Institutions.

There are approximately 250 institutions which belong to the Association of the Private University Preparatory Institutions (Private Preparatory Institutions in Education and Instruction (Eğitim ve Öğretimde Özel Dersaneler), 1987).

Starting from the year of 1987, the Association of the Private University Preparatory Institutions (Özel Dersaneler Birliği) begin to offer an examination which is similar to the first stage known as the Student Selection Examination (Öğrenci Seçme Sınavı, ÖSS). The purpose of this examination is to help students measure their levels of knowledge, to find out their inadequate areas of learning and to provide them with the opportunity to get better prepared for the first stage of the examination.

Similar to the Student Selection Examination (Öğrenci Seçme Sınavı, ÖSS), this exam given by the Association of the Private University Preparatory Institutions (Özel Dersaneler Birliği) consists of two

tests; verbal and quantitative, which measure the same skills that are required by the Student Selection Examination (Öğrenci Seçme Sınavı, ÖSS). The scoring of this examination is exactly similar to the scoring system of the first stage of the examination.

CHAPTER III

METHODOLOGY

In this chapter, the research design of the study will be discussed first. This will be followed by a section with the hypotheses and their operational definitions. There are two main concerns of the study. One is to investigate the combined effects of Mastery Learning Method of Instruction and attendance a Private University Preparatory Institution on measures in regard to school achievement. These measures are the scores on the parallel forms of the Pre-tests on Mathematics, Physics and Chemistry and summative test scores on the three subject areas. Another concern of the study is to test the combined effects of Mastery Learning Method of Institution and Private University Preparatory Institution attendance on measures related to university entrance examination. These measures include the scores on the Mathematics and Science Tests Similar the those given on the Student Placement Examination (ÖYS, 1986), scores on the test given by the Association of Private University Preparatory Institutions (Özdebir, 1987), Student Selection Examination (ÖSS, 1987) and Student Placement Examination (ÖYS, 1987) scores.

Research Design

Subjects of the Study

The sample of this study was chosen from Fenerbahçe Lycée, a public high school in Istanbul. In this high school, the medium of instruction is Turkish. Fenerbahçe Lycée is a co-educational school with a majority of students coming from middle class families. Statistical information concerning the demographic characteristics of the students in the sample in relation to parents' educational background, parents' profession and parents' job are presented in tables 6, 7 and 8 respectively.

TABLE 6. The Percentages of Parents' Educational Levels

	NO SCHOOLING %	ELEMENTARY %	MIDDLE %	LYCEE %	VOCATIONAL %	UNIVERSITY %	TOTAL %
MOTHER	4.5	24.6	15.7	29.1	8.2	17.9	100
FATHER	-	15.7	11.9	15.7	6.0	50.7	100

TABLE 7. The Percentages of Parents' Professional Categories

	HOUSEWIFE %	WORKER %	CIVIL SERVANT %	PROFESSIONAL %	MANAGER I OWN PRIVATE BUSINESS %	TOTAL %
MOTHER	81.8	-	14.4	3.8	-	100
FATHER	-	10.2	24.4	30.0	35.4	100

TABLE 8. The Percentages of Parents' Present Jobs

	HOUSEWIFE %	WORKER %	CIVIL SERVANT %	PROFESSIONAL %	MANAGER I OWN JOB OR OTHER %	TOTAL %
MOTHER	84.7	-	12.2	.8	2.3	100
FATHER	-	8.3	25.6	5.8	60.3	100

The percentages in relation to siblings of the students in the sample are given in table 9:

Table 9. The Percentages of the Students' Siblings

NO SIBS %	1-2	3-4	5 OR MORE	TOTAL
6.0	72.9	17.3	3.8	100

There are 12 sections in the 11th grade level in this lycée; one is the Literature (Edebiyat) section and the rest constitutes the Science (Fen) sections of the 11th grade level. For the researcher's purposes, the Literature Section was not included in the study. Thus, all of the 11 science sections participated in the research in order to assign a sufficient number of students in the four groups that were under consideration.

The total number of students in the 11 science sections were 495. The student distributions in these 11 sections were as follows: There were 44 students in section A, 42 students in section B, 43 students in section C, 44 students in Section D, 47 students in section E, 46 students

in section F, 45 students in section G, 47 students in section H, 44 students in section I, 47 students in section J. and 46 students in section K. However, although 11 science sections were used in the present research, only 136 senior students, 55 female 81 male, comprised the sample of the study. These students were between 15 and 21 years of age with a mean of 16.63 years.

There were 4 groups that were under consideration in this study. The first group included 41 students studying under the Mastery Learning Method of Instruction at school and attending a Private University Preparatory Institution (Mastery Learning+University Preparatory Institute group; ML+UPI group). For this group only one section, namely section H was used. As can be understood, 6 students in this group were excluded because these were the students who did not participate in any Private University Preparatory Institution. There were 21 students in the group under the Mastery Learning Method of Instruction at school, but not attending a Private University Preparatory Institution (Mastery Learning group; ML group). For this cell of the study, 4 sections, namely sections C, F, J and K had to be collapsed to yield a sufficient number of students who were not attending any Private University Preparatory Institutions. In all of these 4 classes, Mastery Learning Method of Instruction was implemented for all of the students in the subject areas of Mathematics, Physics and Chemistry, though only 21 students were included in this

group. There were 43 students in the group under the conventional methods of instruction at school, but attending a Private University Preparatory Institution (University Preparatory Institute group; UPI group). Simiar to the ML+UPI group, only one science section, namely section E was used. It is important to note that 4 students who were not attending any Private University Preparatory Institutions were also excluded from this cell of the study. Lastly, there were 31 students in the group under the conventional methods of instruction at school and not attending a Private University Preparatory Institution (control group). For the control group, 5 science sections, sections A, B, D, G, I were collapsed to provide the required number of students who did not attend any Private University Preparatory Institutions.

All of these sections were taught by 18 different teachers in the subject areas of Mathematics, Physics and Chemistry.

Out of 495 students constituting the 11 science sections of Fenerbahçe Lycée, only 12.53% did not participate in any Private University Preparatory Institution. 87.47% of the total number of students in the 11 science sections attended a Private University Preparatory Institution. On the other hand, out of 136 students, chosen from 495, comprising the sample of the study, 38.2% did not attend any Private University

Preparatory Institution, whereas 61.8% attended the Preparatory Institutions. The duration of attendance to a Private University Preparatory Institution had a mean of 7.33 months for 136 students. Names of the various University Preparatory Institutions and the percentage of students attending each Institution are given in Table 10.

TABLE 10. Names of the Preparatory Institutions and The Percentages of Student Attendance.

NAMES	%
Akademik Bilimler Merkezi	1.2
Anadolu Dersanesi	3.6
Batı Dersanesi	1.2
Büyük Dersane	1.2
Çağdaş Egitim Merkezi	4.9
Dörtler Dersanesi	15.7
Fatih Dersanesi	1.2
Fen Dersanesi	3.6
Fen Bilimleri Dersanesi	6.0
Fen Bilimleri Merkezi	2.4
Modern Eğitim Fen Dersanesi	43.4
Sevinç Dersanesi	1.2
Unkapanı Dersanesi	7.2
Uzman Dersanesi	3.6
Yılaydın Dersanesi	3.6
T O T A L	100

Subject Area

The subject areas under consideration in this research were Mathematics, Physics and Chemistry. The research was conducted in the second semester of the academic year 1986-87 right after the students had returned from their semester brake. Therefore, the subject matter included the entire curricula of the 11th grade level for the second semester on the subject areas of Mathematics, Physics and Chemistry. The textbooks used were;

Matematik Lise 3 (A.Yılmaz, O.Altıntaş, D.Çoker, F.Yıldırım, M.Zirek, Ankara: 1986),

Fizik Lise III (Reşat Otman, İstanbul: 1967) and

Kimya Lise III Fen Kolu (Nurettin Baç, Münevver Baç, İstanbul: 1983).

There were 3 learning units to be covered for Mathematics in the second semester. These learning units were;

Unit 4 : Integrals

Unit 5 : Linear Algebra

Unit 6 : Analytic Geometry

Unit 4 was divided into 3 learning tasks:

Unit 4: Integrals

Learning Task 1: The Definition of The Concept of Integral and Different Techniques of Integration.

Learning Task 2: The Integration of Special Functions

Learning Task 3: Area and Volume Calculations

Unit 5 was divided into 2 learning tasks:

Unit 5: Linear Algebra

Learning Task 4: Matrices

Learning Task 5: Determinants

Unit 6 was divided into 2 learning tasks:

Unit 6: Analytic Geometry

Learning Task 6: Lines

Learning Task 7: Circles

Thus for the subject area of Mathematics, a total of 7 learning tasks in 3 units were involved.

For the subject area of Physics, there were 5 learning units to be covered in the second semester of the 11th grade level curriculum.

Unit 7: Newtonian Law of Gravitation

Unit 8: Wave Motion

Unit 9: Sound

Unit 10: Induction

Unit 11: Alternative Currents

In Physics, each unit constituted a learning task by itself.

There were 4 learning units to be covered for the subject area of Chemistry in the second semester. These were;

Unit 7: Organic Carboxylic Acids

Unit 8: Esters

Unit 9: Aliphatic Ammonia Derivatives

Unit 10: Aromatic Compounds

In Chemistry, each unit also constitutes a learning task.

Each learning task for the subject areas of Mathematics, Physics and Chemistry took approximately 3-10 class period of instruction.

The total number of learning tasks for these three subject areas was 16.

Design of the Study

In this study, the major independent variables are the Mastery Learning Method of Instruction and Private University Preparatory Institution Attendance.

The design of the study is a two by two design and is shown in Figure 1 below:

MASTERY LEARNING

PRIVATE COURSE	Yes	No
Yes	ML+UPI Section H n=41	UPI Section E n=43
No	ML Sections C,F,J,K n=21	Control Sections A,B,D,G,I n=31

Figure 1: The Design of the Study

Two instructional methods were used at the school setting for four different groups of the 11th graders in this study. There was one group (section H) which was instructed under the Mastery Learning Method of Instruction at school and attended a Private University Preparatory Institution (ML+UPI). The second group derived from sections (sections C, F, J, K) was instructed under the Mastery Learning Method of Instruction at school but did not attend a Private University Preparatory Institution (ML). The third group (section E) was instructed under the conventional methods of instruction at school, but attended a Private University Preparatory Institution (UPI). Finally, the control group derived from 5 sections (Sections A, B, D, G, I) was instructed under the conventional methods of instruction at school and did not attend any Private University Preparatory Institutions (control).

Preparation the Study

The subjects of the study were intentionally chosen from Fenerbahçe Lycée because this was the school which met the required conditions for the purposes of the present research for three reasons. First, Fenerbahçe Lycée is a public school primarily geared to the education of middle class students. Secondly, the achievement rank of Fenerbahçe Lycée is determined as 149th among 1346 senior high schools on the 1st stage of the examination, namely the

Student Selection Examination (OSS). On the other hand, the achievement rank of this lycée is determined as 158 in terms of the weighted science scores, as 255 in terms of the weighted mathematics scores, as 319 in terms of the weighted combined Turkish/Mathematics scores on the Student Placement Examination (OYS) for the academic year of 1986-1987. Thirdly, the director of Fenerbahçe Lycée told the researcher that it would be possible to find students at the 11th grade level who did not attend any of the Private University Preparatory Institutions in this lycée. This was important because it was very hard to find students who did not participate in some kind of preparatory work for the University Entrance Exam. Even in this lycée, out of 495 students constituting the 11 science sections, only 12.53% did not attend any Private University Preparatory Institutions. 87.47% of the total number of students in the 11 science sections attended a Private University Preparatory Institution. Since the director of the school required an official permission from the Ministry of Education Youth and Sports, it was not possible to start legally the present research before the second semester. However, the researcher got acquainted with all of the 18 Mathematics, Physics and Chemistry tachers during the beginning of the 1st semester and asked them whether they would like to participate in the present study. In these interviews, the content of the study as well as the purpose were explained to the teachers. There were 9 Mathematics, 5

Physics and 4 Chemistry teachers totalling to 18 instructing the 11th grades at Fenerbahçe Lycée. Although most of the teachers volunteered to participate in the study, the researcher had to choose those teachers who were most enthusiastic, cooperative and who had been teaching more than one class for the arrangement of a convenient training program. After working out all of the programs for 9 Mathematics, 5 Phisics and 4 Chemistry teachers, it was possible to reduce the number of teachers that were going to participate in the study to 9. There were 4 Mathematics, 2 Physics and 3 Chemistry teachers who implemented the Mastery Learning Method of Instruction in their classes throught the 2nd semester. Out of 4 Mathematics teachers, one taught two of the science sections (sections H and J). The other 3 teachers had one science section each in the subject area of Mathematics; namely, section C, F and K had been taught by 3 different teachers under the Mastery Learning Method of Instruction. As far as Physics is concerned, one teacher had three of the science sections; that is, sections F, H and K were taught by the same teacher. Another Physics teacher had the other two science sections; namely sections C and J. For the subject area of Chemistry, one of the Chemistry teachers was teaching 3 of the science sections; sections C, J and K. The other two teachers had one section each; namely sections F and H were taught by 2 different teachers. The teachers instructing the group under conventional methods of instruction at school but attending a Private University

Preparatory Institution (section H) and control group (sections A, B, D, G, I) used their traditional methods in the subject areas of Mathematics, Physics and Chemistry.

Training the Experimental Teachers

In December 1986, 4 Mathematics, 2 Physics and 3 Chemistry teachers of the ML+UPI (section H) and ML groups (sections C, F, J, and K) were informed about the Mastery Learning Method of Instruction as well as about the purpose and the content of the study. Moreover, a copy of the source book Öğrenme Düzeyi ve Ürünleri (Level of Learning and Its Products), by Güzver Yıldıran (1982) was provided to 9 of the teachers. The training started on the 8th day of December, 1986, and ended on the 16th of January, 1987. The researcher met with the teachers in small groups according to their subject area and; the objectives for each learning task were prepared by the teachers with the help of the researcher. In addition to this, 9 teachers prepared the pre-tests and their parallels in Mathematics, Physics and Chemistry which tapped the important objectives of the 1st semester's curriculum and were the necessary prerequisites for the mastery of the 2nd semester's curriculum. It is important to note here that the pre-tests and their parallels were developed by teachers before they were told for what implementation they would be responsible.

The teachers of the other two groups; that is, the group under the conventional method of instruction at school

but attending the Private University Preparatory Institutions and the control group, were instructed to use their traditional methods of teaching. Thus, they received no instruction about the Mastery Learning Method of Instruction.

Procedures

The study started on the 9th day of February 1987, and ended on the 27th of May, 1987. The whole study, with the preparation for the study and implementation of the method, lasted for seven months.

The study was carried out in 2 parts. The first part was conducted during the last week of the 1st semester. The second part was conducted throughout the second semester until the final day of the school, and included the entire curricula of the second semester for the 11th grade level in three subject areas. The first part of the study, taking place during the last week of the first semester, consisted of the administration of a questionnaire developed by the researcher and her thesis advisor Guzver Yildiran to determine the number of students who attended a Private University Preparatory Institution and those who did not participate in such Preparatory Institutions. The questionnaire had items related to the type and duration of preparation the students had done both in eleventh grade, and in the previous years. It also included questions

related to some of the demographic characteristics of this group (see Appendix for the instrument).

In all of the 11 science sections except two, the questionnaires were administered during the guidance hour of Fenerbahce Lycee by their class teachers. The researcher administered the questionnaires to the other two science sections (sections J and K) herself.

After the administration of the questionnaires during the last week of the 1st semester, 3 pre-tests in the subject areas of Mathematics, Physics and Chemistry, one in each, were given to all of the 11 science sections during the same week of the 1st semester. The pre-tests on Mathematics, Physics and Chemistry which included the important objectives of the 1st semester's curriculum were prepared by the 9 course teachers with the help of the researcher and were administered to determine the deficiencies and inadequacies of the students in these courses.

According to the results obtained on the pre-tests, students in the ML+UPI (section H) and in the ML (sections C, F, J and K) groups were asked to participate in a review course which was conducted by their course teachers. The students in the UPI (section E) and control groups (sections A, B, D, G, I) did not participate in this review session. This review course took place right after the students had returned from their semester brake. All of

the students in the two groups were asked to attend the review course since the means of these pre-test in the three subject areas under consideration were low. Table 11 gives the means, standard deviations and the maxium possible points for each pre-test in Mathematics, Physics and Chemistry as well as their parallel forms given to all of the students in the four groups.

TABLE 11. Maximum Possible Points, $\bar{X}$ and Sd for Pre-tests and Their Parallels in the Subject Areas of Mathematics, Physics and Chemistry for the four groups.

	MATHEMATICS								PHYSICS								CHEMISTRY							
	ML+UPI		ML		UPI		C		ML+UPI		ML		UPI		C		ML+UPI		ML		UPI		C	
	Pre-Test	Pre-Par	Pre-Test	Pre-Par	Pre-Test	Pre-Par	Pre-Test	Pre-Par	Pre-Test	Pre-Par	Pre-Test	Pre-Par	Pre-Test	Pre-Par	Pre-Test	Pre-Par	Pre-Test	Pre-Par	Pre-Test	Pre-Par	Pre-Test	Pre-Par	Pre-Test	Pre-Par
Max Poss. Points	19	20	19	20	19	20	19	20	20	20	20	20	20	20	20	20	23	23	23	23	23	23	23	23
$\bar{X}$	9.027	13.150	7.421	12.238	9.395	9.512	8.129	7.645	12.439	14.846	9.857	13.238	12.000	11.581	8.517	8.276	14.744	16.027	11.524	15.053	12.372	12.619	11.323	11.452
S_d	3.122	4.400	2.341	3.604	2.779	3.261	2.705	2.767	1.629	2.072	3.071	3.208	2.785	2.575	3.112	2.890	3.160	2.853	3.296	3.808	3.512	3.609	3.260	3.171

The review course took place on the first week of the second semester during their 7 regular class periods for Mathematics, 4 class period for Physics and 3 class periods for Chemistry, In addition to 1 extra hour each day of the week for each subject area totalling to 12 hours for Mathematics, 9 hours for Physics and 8 hours for Chemistry. This review course aimed to provide the students in the ML+UPI and ML groups with the necessary prerequisites for the second semester. The emphasis was basically on furnishing the students with the Cognitive Entry Behaviors of the second semester and with remedial help an inadequate areas of the 1st semester's curriculum in Mathematics, Physics and Chemistry. The students in the group under the conventional method of instruction at school but attending the Private University Preparatory Institutions (UPI), and the students in the control group did not participate in the review course. During the 2nd week of the 2nd semester, all of the students in the 4 groups (all of the 11 science section students) were administered a parallel form of the pre-tests in the subject areas of Mathematics, Physics and Chemistry separately to determine the effects of correctives given during the review course. These parallel forms of the Pre-tests were constructed by the 9 course teachers with the help of the researcher. Comparisons of the four groups in terms of pre-tests and their parallels in Mathematics, Physics and Chemistry are made (See the Results section)

There were 7 learning tasks in Mathematics, 5 learning tasks in Physics and 4 learning tasks in Chemistry totalling to 16 learning tasks altogether. Each learning task took approximately 3-10 class periods of instruction. The criterion level was set at 80% level of learning. The group under the Mastery Learning Method of Instruction at school and attending a Private University Preparatory Institution (ML+UPI) and the group under Mastery Learning Method of Instruction at school but not attending a Private University Preparatory Institution (ML) were taught under Mastery Learning Method of Instruction throughout the 16 learning tasks in the subject areas of Mathematics, Physics and Chemistry. In these 2 groups (sections C, F, J, K and section H - 5 classes), a formative test was administered to all of the students at the end of each learning task. Feedback and correctives were provided to the students who could not reach the pre-set criterion level of achievement, 80%, by going over the objectives they did not get for each learning task. After this systematic intervention, a parallel form of the formative test was given to those who could not reach the 80% criterion level of learning in the ML+UPI and ML groups. In some of the learning tasks, additional feedback and conectives were given to those who still did not reach the criterion level followed by a second parallel form of the formative test. These formative tests took approximately 20-45 minutes, having 8-28 items (See Appendix for the formative tests and their parallels).

The other two groups; that is, the group under conventional method of instruction at school but attending a Private University Preparatory Institution (UPI; Section E) and the control group (sections A, B, D, G, I) were taught under the conventional methods of instruction throughout the second semester in all of these 16 learning tasks. However, at the end of each learning task students in these 2 groups were given the formative tests but no systematic intervention in terms of feedback and correctives. They also did not get the parallel forms of the formative tests.

At the completion of all the learning tasks in the second semester's curriculum, 3 summative tests in the subject areas of Mathematics, Physics and Chemistry were administered to all of the students in the four groups on the same day. in addition to the three summative tests, a Mathematics and a Science Test which were similar to those given on the Student Placement Examination (OYS, 1986) were administered to all of the students in the four groups on the last week of the school. In addition to these tests, the students in the sample had taken the test given by the Association of Private University Preparatory Institution (Ozdebir) on the 1st of March, 1987. Moreover, the students in the sample had also taken the Student Selection Examination (OSS) which was held on the 19th of April, 1987 as well as the Student Placement Examination (OYS) which was on the 28th of June 1987.

For the subject areas of Mathematics, and Physics, all of the formative tests, their parallels, summative tests and the Mathematics and Science Tests similar to those given on the Student Placement Examination (OYS, 1986) were prepared by two engineers from the Istanbul Technical University who were senior students and were tutoring at the time the study was conducted. For the subject area of Chemistry, all of the above mentioned tests were constructed by an instructor who was teaching the 11th grade level at a public senior high school in Istanbul while the study was in process.

The objectives for each learning task in the subject areas of Mathematics, Physics and Chemistry were prepared by the 9 course teachers with the help of the researcher during their training period.

Data Collection and Analysis

Initial Measures: The students in all of the 11 science section were administered a questionnaire during the last week of the 1st semester to determine the number of students who were attending the Private University Preparatory Institutions and those who were not participating in such Preparatory Institutions. Another purpose for the administration of this questionnaire was to collect data in relation to some of the demographic characteristics of the 11th graders in Fenerbahçe Lycée.

The students in all of the 4 groups under consideration in this research were given 3 pre-tests in the subject areas of Mathematics, Physics and Chemistry one in each during the same week of the 1st semester to determine the deficiencies in the 1st semester's curriculum.

Process Measures: 3 parallel forms of the pre-tests in the subject areas of Mathematics, Physics and Chemistry were given to all of the students to check the effects of the review course held during the first week of the 2nd semester. A formative test was given to all of the students at the completion of each learning task for every subject area. Parallel forms of the formative tests were administered after correctives for students who could not reach the preset criterion level of achievement which was 80% level of learning in the groups under Mastery Learning Method of Instruction at school and attending the Private University Preparatory Institutions and the students in the group under Mastery Learning Method of Instruction at school but not attending Private University Preparatory Institutions. If students could not reach this 80% criterion level after the first parallel, correctives were again given which were followed by a second parallel from of the formative test to these two groups (See Appendix for these tests).

Final Measures: There are several final measures in this research that are under consideration. The first one

is the three summative tests which were administered to all of the students in the 4 groups at the completion of all the learning tasks in the subject areas of Mathematics, Physics and Chemistry. The second final measure is a Mathematics and a Science Test which were similar to those given on the Student Placement Examination (ÖYS, 1986). The third final measure is the scores on the test given by the Association of the Private University Preparatory Institutions (Özdebir, 1987). The fourth final measure is the scores on the Student Selection Examination (ÖSS, 1987). The last final measure is the Science, Mathematics and the combined Turkish/Mathematics scores of the Student Placement Examination (ÖYS, 1987).

Concerns of the Study

The main concern of this study is two fold. One is to test the combined effects of Mastery Learning Method of Instruction and attendance to a Private University Preparatory Institution on measures related to the school curriculum within the formal education system including the parallel forms of the pre-test scores on Mathematics, Physics and Chemistry, and summative test scores on these three subject areas. Another concern of this study is to investigate the combined effects of Mastery Learning Method of Instruction and attendance to a Private University Preparatory Institution on measures which are related to university entrance examination including scores on the Mathematics and Science Tests similar to those given on Student Placement Examination (ÖYS, 1986), scores on the test given by the Association of Private University Preparatory Institutions (Özdebir, 1987), Student Selection Examination (ÖSS, 1987) and Student Placement Examination (ÖYS, 1987).

There are 9 hypotheses in the study. The first hypothesis is stated as:

HYPOTHESIS 1. THE SCORES OF THE STUDENTS IN THE FOUR GROUPS (ML+UPI, UPI, ML, C) WILL NOT SIGNIFICANTLY DIFFER FROM ONE ANOTHER ON THE MATHEMATICS, PHYSICS AND CHEMISTRY PRE-TESTS.

Variables and Their Operational Definitions

The Independent Variable: There is no independent variable in relation to the first hypothesis of the study.

The Observed Variable of this hypothesis is the achievement levels of the students as measured by three pre-tests in the subject areas of Mathematics, Physics and Chemistry (one in each). The Pre-tests in Mathematics, Physics and Chemistry included the objectives tapping the first semester's curriculum for the related subject areas. These Pre-Tests were prepared by the course teachers of Fenerbahçe Lycée with the assistance of the researcher for each subject area. It is important to note at this point that the teachers constructing the tests had not yet been told for what intervention they would be responsible. Mathematics Pre-Test consisted of 19 items. One class period (40 minutes) was given to answer the questions. Similarly, Physics Pre-test consisted of 20 items. Again, one class period was also given for the administration of this test. Finally, the Chemistry Pre-test included 23 items. One class period was given to answer the questions (See Appendix for the Mathematics, Physics and Chemistry Pre-tests).

The second hypothesis of the study is as follows:

HYPOTHESIS 2. THERE WILL BE A SIGNIFICANT EFFECT OF MASTERY LEARNING METHOD OF INSTRUCTION AND PRIVATE UNIVERSITY PREPARATORY INSTITUTION ATTENDANCE ON THE PARALLEL FORMS OF THE PRE-TESTS ON MATHEMATICS, PYSICS AND CHEMISTRY.

Variables and Their Operational Definitions

The Independent Variables of this hypothesis are the Mastery Learning Method of Instruction and attending a Private University Preparatory Institution. The groups which were instructed under Mastery Learning Method of Instruction were ML+UPI (Section) and ML (section C, F, J, K) groups. This Strategy was implemented for the subject areas of Mathematics, Physics and Chemistry. The main subvariables of this method of instruction used in the study are cues, reinforcement, participation, feedback and correctives. The students in the ML+UPI and ML groups were provided with remedial help and correctives in relation to the first semester curriculum which also constituted the necessary prerequisites for the mastery of the 2nd semester's curriculum in the subject areas of Mathematics, Physics and Chemistry. The other independent variable of the study is attending the Private University Preparatory Institution. The students in the ML+UPI and UPI groups attended a Private University Preparatory Institution.

The Dependent Variable of this hypothesis is the achievement level of students as measured by the Parallel Forms of the Pre-tests in Mathematics, Physics and Chemistry. These 3 tests in the related subject areas included the objectives of the 1st semester's curriculum in Mathematics, Physics and Chemistry. Parallel Forms of the Pre-tests are again developed by the course teachers with the help of the researcher before they were told about the intervention they were gain to use. Parallel Form of the Mathematics Pre-test included 20 items, Parallel Form of the Physics Pre-test included 20 items and Parallel Form of the Chemistry Pre-test included 23 items. For each of the Parallel Forms of the Pre-tests, 40 minutes, namely 1 class period is given to the students to answer the questions in the related subject areas. (See Appendix for the Parallel Form of the Mathematics, Physics and Chemistry Pre-tests).

The third hypothesis of the study is as follows:

HYPOTHESIS 3. THERE WILL BE A SIGNIFICANT EFFECT OF MASTERY LEARNING METHOD OF INSTRUCTION AND PRIVATE UNIVERSITY PREPARATORY INSTITUTION ATTENDANCE ON THE MATHEMATICS, PHYSICS AND CHEMISTRY SUMMATIVE TESTS.

Variables and Their Operational Definitions

The Independent Variables of this hypothesis are attending the Private University Preparatory Institution and Mastery Learning Method of Instruction.

The students in the ML+UPI and UPI groups attended a Private University Preparatory Institution. The duration of attendance had a mean of 7.33 months and a standard deviation of 2.1. The other independent variable is the Mastery Learning Method of Instruction. The main subvariables of this method are cues, reinforcement, participation, feedback and correctives. Cues, reinforcement and participation were utilized through the instruction of the learning tasks. Formative tests and their parallels (see Appendix for these tests) gave information to the teachers as to which of the objectives were accomplished by the students. Thus correctives were given to students who could not reach the 80% criterion level of achievement on these tests. Mastery Learning Method of Instruction was

implemented for the students in the ML+UPI and ML groups for the subject areas of Mathematics, Physics and Chemistry.

The Dependent Variable of this hypothesis is the achievement levels of the students measured by the 3 summative tests in the subject areas of Mathematics, Physics and Chemistry. Mathematics Summative Test included 7 learning tasks derived from 3 learning units. In other words, the first learning unit was divided into 3 learning tasks, the second learning unit into 2 and the last learning unit into 2 learning tasks totalling 7 learning tasks which were represented in the Mathematics Summative Test (See Appendix for this test). This test consisted of 100 items.

The time alotted was 120 minutes. Physics Summative Test (See Appendix for this test) included 80 items. The time given for the administration of this test was 90 minutes. Lastly, Chemistry Summative Test consisted of 4 learning tasks. This test included 85 items. The time given to answer these questions was 100 minutes. (See Appendix for this test).

The fourth hypothesis of the study can be stated as:

HYPOTHESIS 4. THERE WILL BE A SIGNIFICANT EFFECT OF PRIVATE UNIVERSITY PREPARATORY INSTITUTION ATTENDANCE AND MASTERY LEARNING METHOD OF INSTRUCTION ON THE MATHEMATICS AND SCIENCE TESTS SIMILAR TO THOSE GIVEN ON THE STUDENT PLACEMENT EXAMINATION (ÖYS, 1986)

Variables and Their Operational Definitions

The Independent Variables of this hypothesis are again attending the Private University Preparatory Institution and Mastery Learning Method of Instruction as it is stated in the third hypothesis.

The Dependent Variable of this hypothesis is the achievement levels of the students measured by the Mathematics and Science Tests similar to those given on the Student Placement Examination (ÖYS, 1986). The Mathematics Test included 33 items. The time alotted for this test was 50 minutes. On the other hand, Science Test Consisted of 48 items. 70 minutes were given to answer the questions. The total time alotted for these two tests was 120 minutes (See Appendix for these tests). The number of items on these two tests were exactly the same as the number of items on the Student Placement Examination (ÖYS, 1986).

The fifth hypothesis of the study is stated as:

HYPOTHESIS 5. THERE WILL BE A SIGNIFICANT EFFECT OF PRIVATE UNIVERSITY PREPARATORY INSTITUTION ATTENDANCE AND MASTERY LEARNING METHOD OF INSTRUCTION ON THE TEST GIVEN BY THE ASSOCIATION OF PRIVATE UNIVERSITY PREPARATORY INSTITUTIONS (ÖZDEBIR, 1987).

Variables and Their Operational Definitions

The Independent Variables of this hypothesis are again attending Private University Preparatory Institution and Mastery Learning Method of Instruction which were stated as in the third and fourth hypothesis of the study.

The Dependent Variable of this hypothesis is the achievement levels of the students measured by the test given by the Association of Private University Preparatory Institutions (Özdebir, 1987). This test consisted of two parts; namely the verbal and quantitative tests. There were 75 questions in each part. The time alotted for the verbal and quantitave tests was 80 minutes for each part, totalling to 160 minutes for the whole examination.

The sixth hypothesis of the study can be stated as:

HYPOTHESIS 6. THERE WILL BE A SIGNIFICANT EFFECT OF PRIVATE UNIVERSITY PREPARATORY INSTITUTION ATTENDANCE AND MASTERY LEARNING METHOD OF INSTRUCTION ON STUDENT SELECTION EXAMINATION (OSS, 1987).

Variables and Their Operational Definitions

The Independent Variable of this hypothesis are the same as stated in the third, fourth and fifth hypotheses of the study.

The Dependent Variable of this hypothesis is the achievement levels of the students measured by the Student Selection Examination (OSS, 1987). This examination consisted of three subtests which were verbal, quantitative and a foreign language test. The verbal and the quantitative tests included 76 items each whereas there were 30 items in the foreign language test. The total number of items included in the three subtests were 182. The time alotted for the three subtests were 180 minutes. It was suggested that 75 minutes should be spent for each of the verbal and quantitative tests. On the other hand, 30 minutes should be spent for the language subtest.

The seventh hypothesis of the study is stated as:

HYPOTHESIS 7. THERE WILL BE A SIGNIFICANT EFFECT OF PRIVATE UNIVERSITY PREPARATORY INSTITUTION ATTENDANCE AND MASTERY LEARNING METHOD OF INSTRUCTION ON SCIENCE SCORES OF THE STUDENT PLACEMENT EXAMINATION (ÖYS-FEN, 1987).

Variables and Their Operational Definitions

The Independent Variable of this hypothesis are the same as stated in the third, fourth, fifth and sixth hypotheses of the study.

The Dependent Variable of this hypothesis is the science scores of the students on the Student Placement Examination (ÖYS-Fen, 1987). On Student Placement Examination (ÖYS, 1987), a five-test battery test was used. These subtests were Natural Sciences, Mathematics, Turkish Language and Literature, Social Sciences and a Foreign Language. There were 60 items on the Natural Sciences Test, 52 items on the Mathematics Test, 62 items on the Turkish Language and Literature Test, 70 items on the Social Sciences Test and 75 items on the Foreign language Test, totalling to 319 questions on the Student Placement Examination. The total time alotted for the Student Placement Examination was 210 minutes.

The eighth hypothesis of the study is stated as:

HYPOTHESIS 8. THERE WILL BE A SIGNIFICANT EFFECT OF PRIVATE UNIVERSITY PREPARATORY INSTITUTION ATTENDANCE AND MASTERY LEARNING METHOD OF INSTRUCTION ON THE MATHEMATICS SCORES OF THE STUDENT PLACEMENT EXAMINATION (ØYS-MAT, 1987).

Variables and Their Operational Definitions

The Independent Variable of this hypothesis are the same as stated in the third, fourth, fifth, sixth and seventh hypotheses of the study.

The Dependent Variable of this hypothesis is the mathematics scores of the students on the Student Placement Examination (ØYS-Mat, 1987). One of the subtests on the Student Placement Examination was the Mathematics test. There were 52 items on this test.

The ninth hypothesis of the study can be stated as:

HYPOTHESIS 9. THERE WILL BE A SIGNIFICANT EFFECT OF PRIVATE UNIVERSITY PREPARATORY INSTITUTION ATTENDANCE AND MASTERY LEARNING METHOD OF INSTRUCTION ON THE COMBINED TURKISH/MATHEMATICS SCORES OF THE STUDENT PLACEMENT EXAMINATION (ÖYS-TM, 1987).

Variables and Their Operational Definitions

The Independent Variable of this hypothesis are the same as stated in the third, fourth, fifth, sixth, seventh and eighth hypotheses of the study.

The Dependent Variable of this hypothesis is the Combined Turkish/Mathematics scores of the students on the Student Placement Examination (ÖYS-TM, 1987). There were 52 items on the Mathematics Test and 62 items on the Turkish Language and Literature Test. The Combined Turkish/Mathematics (TM) score was one type of weighted Student Placement Examination (ÖYS) score calculated on this examination.

These 9 hypotheses of the study were statistically tested by one-way analysis of variance, two-way analysis of variance, Newman-Keuls formula, t-test analyses, E correlation ratios and effect size analyses.

CHAPTER IV

RESULTS

This study is constructed to test nine hypotheses. The first one is that the scores of the students in the four groups (ML+UPI, UPI, ML and control) will not significantly differ from one another on the Mathematics, Physics and Chemistry Pre-tests. The second hypothesis of the study is that there will be a significant effect of Mastery Learning Method of Instruction and Private University Preparatory Institution attendance on the parallel forms of the Pre-tests on Mathematics, Physics and Chemistry. The third hypothesis is that there will be a significant effect of Mastery Learning Method of Instruction and Private University Preparatory Institution attendance on the Mathematics, Physics and Chemistry Summative Tests. The fourth hypothesis of the study is that there will be a significant effect of Private University Preparatory Institution attendance and Mastery Learning Method of Instruction on the Mathematics and Science Tests similar to those given on the Student Placement Examination (OYS, 1986). The fifth hypothesis of the study is that there will be a significant effect of Private University Preparatory Institution attendance and Mastery Learning Method of Instruction on the Test given by the Association of Private University Preparatory Institutions (Ozdebir, 1987). The sixth hypothesis is that there will be a significant effect

of Private University Preparatory Institution attendance and Mastery Learning Method of Instruction on Student Selection Examination (OSS, 1987). The seventh hypothesis is that there will be a significant effect of Private University Preparatory Institution attendance and Mastery Learning Method of Instruction on the Science scores of the Student Placement Examination (OYS-Fen, 1987). The eighth hypothesis of the study is that there will be a significant effect of Private University Preparatory Institution attendance and Mastery Learning Method of Instruction on the mathematics scores of the Student Placement Examination (OYS-Mat, 1987). The ninth hypothesis is that there will be a significant effect of Private University Preparatory Institution attendance and Mastery Learning Method of Instruction on the combined Turkish/Mathematics scores of the Student Placement Examination (OYS-TM, 1987).

The stated hypotheses are tested under two instructional methods at the school setting. There was one group (section H) instructed under the Mastery Learning Method of Instruction at school and attending a Private University Preparatory Institution (ML+UPI). The second group was derived from 4 sections (sections C, F, J, K) all instructed under the Mastery Learning Method of Instruction at school, but not attending a Private University Preparatory Institution (ML). The third group (section E) was instructed under the conventional method of instruction at school, but attending a Private University Preparatory

Institution (UPI). The fourth group was the control group derived from 5 sections (sections A, B, D, G, I) instructed under the conventional method instruction at school and not attending any Private University Preparatory Institution (control).

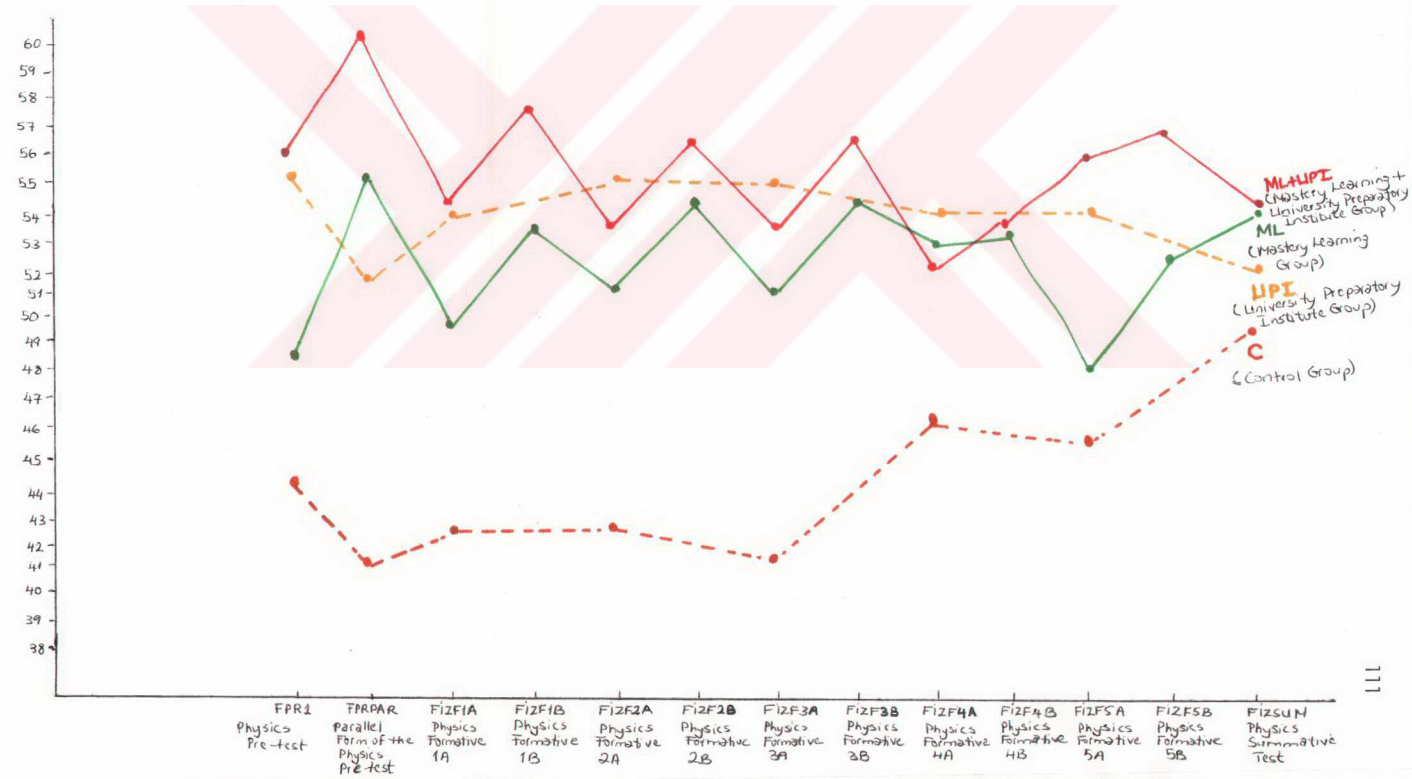
There were 41 students in the group under the Mastery Learning Method of Instruction at school and attending a Private University Preparatory Institution (section H), 21 students in the group under the Mastery Learning Method of Instruction at school but not attending a Private University Preparatory Institution (section C, F, J, K), 43 students in the group under the conventional method of instruction at school, but attending a Private University Preparatory Institution (section E) and 31 students in the group under the conventional method of instruction at school and not attending a Private University Preparatory Institution (section A, B, D, G, I).

Analysis of Effectiveness of Instruction

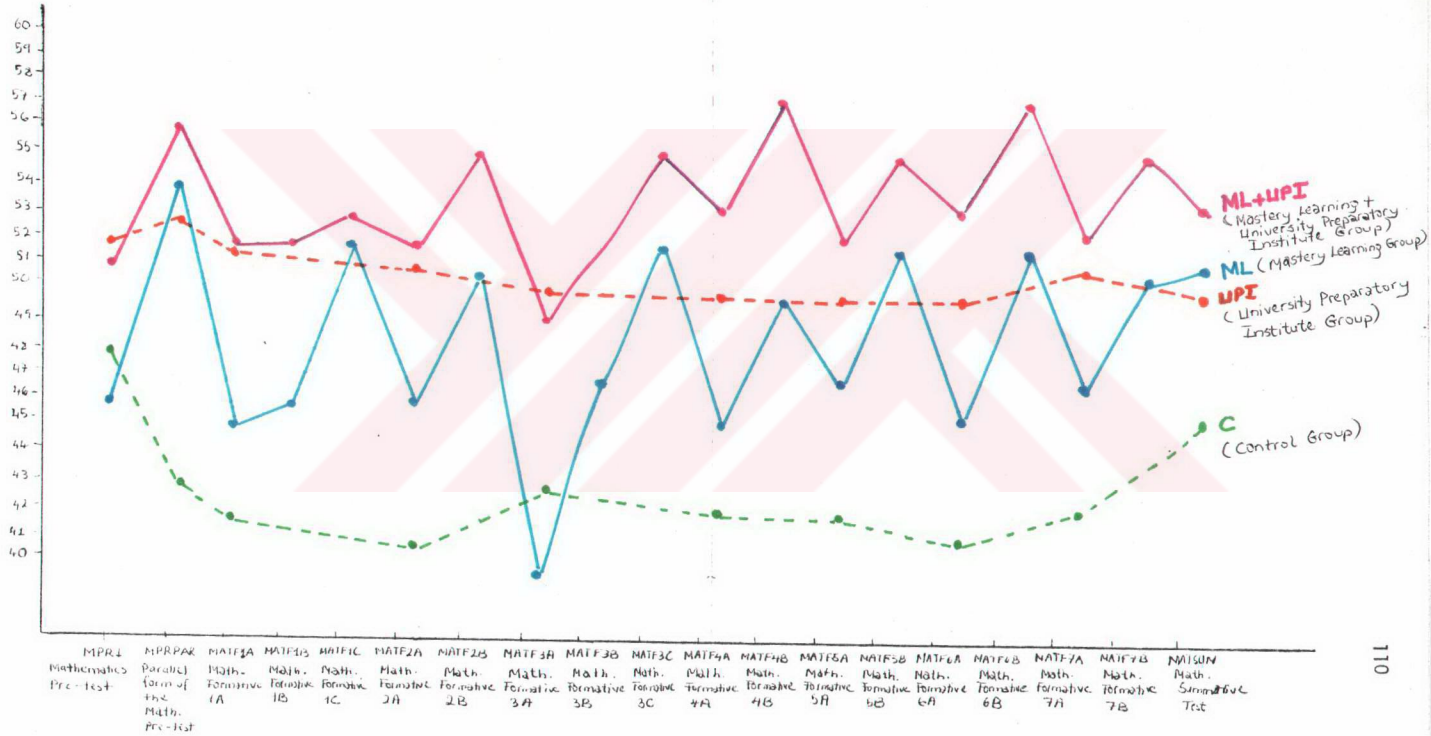
The mean performances of each group were plotted to show graphically how the groups started to differ in performance after the feedback and correctives provided during the review course held on the first week of the second semester as well as after the first formative test as a result of Mastery Learning Method of Instruction and Private University Preparatory Institution attendance. Graph

1, 2, and 3 give these differences for the subject areas of Mathematics, Physics and Chemistry, respectively.

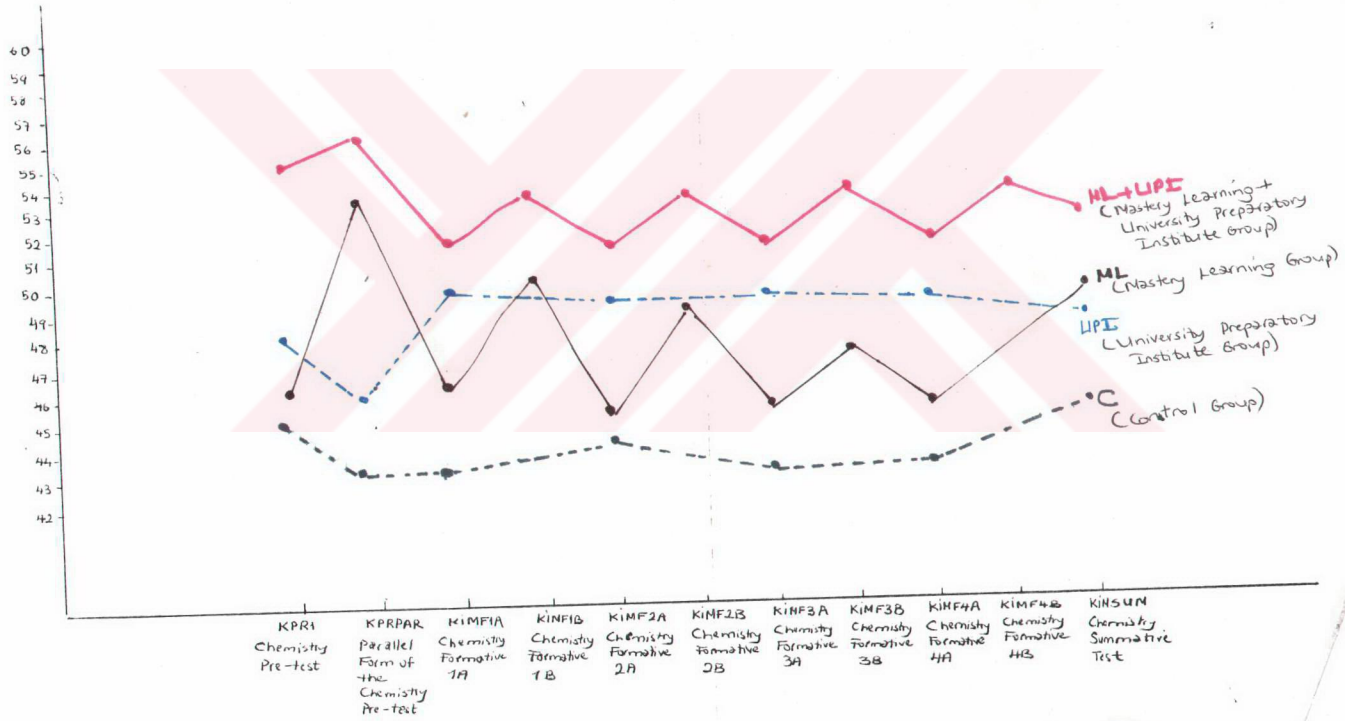
GRAPH 2: The Mean Performances of Each Group on the Physics Pre-test, Its Parallel Formative and Summative Tests.



GRAPH 1: The Mean Performances of Each Group on the Mathematics Pre-test, Its Parallel, Formative and Summative Tests.



GRAPH 3: The Mean Performances of Each Group on the Chemistry Pre-test, Its Parallel Formative and Summative Tests.



Analysis Done on Each Hypothesis

In this section, the analyses done to test the hypotheses of the study are presented.

The first hypothesis of the study is:

HYPOTHESIS 1: THE SCORES OF THE STUDENTS IN THE FOUR GROUPS (ML+UPI, UPI, ML AND CONTROL) WILL NOT SIGNIFICANTLY DIFFER FROM ONE ANOTHER ON THE MATHEMATICS, PHYSICS AND CHEMISTRY PRE-TESTS.

In order to test this hypothesis, One-way Analysis of variance, the Newman-Keuls test, T-test analyses and effect size analyses are used. One-way Analysis of Variance test is used to check if there are any significant differences among the four groups in terms of the first semester's curriculum on Mathematics, Physics and Chemistry measured by the 3 Pre-tests prior to instruction. Table 12 shows the One-way ANOVA test done on the Mathematics, Physics and Chemistry Pre-test scores of the four groups.

TABLE 12. One-way Analysis of Variance on the Mathematics, Physics and Chemistry Pre-test Scores of the Four Groups (ML+UPI, UPI, ML and control).

	DF	MS	ERROR	ERROR	F	Significance Level
Mathematics	3	21.9775	126	7.8839	2.7877	p<.05
Physics	3	110.9672	129	6.8520	16.1948	p<.00001
Chemistry	3	85.1137	130	11.0269	7.7187	p<.0001

According to the results of One-way ANOVA, there are significant differences among the four groups in terms of the first semester's curriculum on Mathematics, Physics and Chemistry measured by the 3 Pre-tests in the related subject areas. The results show that the groups significantly differ from one another at the .05, .00001 and .0001 levels in terms of the subject areas of Mathematics, Physics and Chemistry, respectively. The findings suggest that the groups are different from one another before the implementation of the Mastery Learning Method of Instruction.

Mathematics, Physics and Chemistry Pre-test scores are again compared by using the Newman-Keuls formula to check if there are significant differences among the four

groups prior to instruction. Table 13 gives these comparisons.

TABLE 13. Comparison of the Mathematics, Physics and Chemistry Pre-test Scores of the Four Groups, using the Newman-Keuls formula.

	ML+UPI (1)		UPI (2)		ML (3)		Control (4)		Calculated q		Significance Level	
	DF	MS error	DF	MS error	DF	MS error	DF	MS error				
Mathematics	126	7.884	126	7.884	126	7.884	126	7.884	1>3 2>3	3.47 4.26	1>3 $q_{r\alpha}$<.05 2>3 $q_{r\alpha}$<.05 2>1 N.S. 1>4 N.S. 4>3 N.S. 3>4 N.S.	
Physics	129	6.852	129	6.852	129	6.852	129	6.852	1>3 1>4 2>3 2>4	5.49 8.34 4.56 7.41	1>3 $q_{r\alpha}$<.01 1>4 $q_{r\alpha}$<.01 2>3 $q_{r\alpha}$<.01 2>4 $q_{r\alpha}$<.01 1>2 N.S. 3>4 N.S.	
Chemistry	130	11.027	130	11.027	130	11.027	130	11.027	1>3 1>2 1>4	5.37 3.95 5.70	1>3 $q_{r\alpha}$<.05 1>3 $q_{r\alpha}$<.01 1>4 $q_{r\alpha}$<.01 2>3 N.S. 3>4 N.S. 2>4 N.S.	

The results of Table 13 show that are significant differences between the Mathematics, Physics and Chemistry Pre-test scores of the four groups. In the subject area of Mathematics, when ML+UPI group is compared to ML group, the

difference is significant at the .05 level. Similarly, when the students in the UPI group are compared to the students in the ML group, the difference is again significant at the same level. As can be seen from the findings, ML group scores significantly lower than the ML+UPI and UPI groups; the other groups not differing significantly from one another. For the subject area of Physics, ML+UPI and UPI groups are similar to each other while they both differ significantly from the ML and the control groups, the latter two also being similar to each other. For the subject area of Chemistry, ML+UPI group scores significantly higher than any of the other groups.

In summary, the groups differ from one another in terms of the first semester's curriculum on Mathematics, Physics and Chemistry before Mastery Learning Method of Instruction is implemented. In the three subject areas, ML+UPI and UPI groups score significantly higher than ML and control groups.

For further comparison purposes, t-test analyses are utilized to check whether there are significant differences among the four groups prior to instruction. Table 14 shows the comparisons between the Mathematics, Physics and Chemistry Pre-test scores of the students in the four groups (ML+UPI, UPI, ML and control).

TABLE 14. Comparison of the Means of the Mathematics, Physics and Chemistry Pre-test Scores of the Students in the Four Groups, using t-test analyses.

	ML + UPI (1)			UPI (2)			ML (3)			Control (4)			t-value	Significance Level
	$\bar{X}$	S_e	n	$\bar{X}$	S_e	n	$\bar{X}$	S_e	n	$\bar{X}$	S_e	n		
Mathematics	9.0270	3.122	37	9.3953	2.779	43	7.4211	2.341	19	8.1290	2.705	31	1>3 = 1.97 2>3 = 2.70 2>4 = 1.96	1>3 p<.05 2>3 p<.01 2>4 p<.01 2>1 N.S. 1>4 N.S. 3>4 N.S.
Physics	12.4390	1.629	41	12.0000	2.785	42	9.8571	3.0712	21	8.5172	3.112	29	1>3 = 3.60 1>4 = 6.21 2>3 = 2.78 2>4 = 4.94	1>3 p<.001 1>4 p<.0001 2>3 p<.01 2>4 p<.0001 1>2 N.S. 3>4 N.S.
Chemistry	14.7436	3.160	39	12.3721	3.512	43	11.5238	3.296	21	11.3226	3.260	31	1>3 = 3.71 1>2 = 3.20 1>4 = 4.44	1>3 p<.0001 1>2 p<.001 1>4 p<.0001 2>3 N.S. 2>4 N.S. 3>4 N.S.

Results of Table 14, using t-tests are generally similar to the results of the Newman-Keuls formula. As the findings suggest, there are significant differences among the four groups in terms of the Mathematics, Physics and Chemistry Pre-test scores. As far as Mathematics is concerned, ML group has the lowest mean of 7.42 among the other groups. However, the means of ML+UPI and UPI groups are simiar to each other, namely 9.02 and 9.4, respectively. ML+UPI and UPI groups score significantly higher than the other two groups on the Mathematics Pre-test. Similarly, ML+UPI and UPI groups are significantly different from ML and control groups, the former two having similar means on the Physics Pre-test. For the Chemistry Pre-test, ML+UPI group scores significantly different from any other group, having the highest mean performance. The means of ML group and the control are similar to each other on the Chemistry Pre-test.

Effectsize analyses are also used to test the first hypothesis of the study.

When effect size analysis is done on the ratio of the difference between the means of ML+UPI and the ML group in relation to the standard deviation of the ML group for the Pre-test on Mathematics, a difference of .69, more than half a standard deviation is found between these two

classes.(1) When an effect size analysis is also done on the ratio of the difference between the means of UPI and ML groups in relation to the standard deviation of ML group for the Pretest on Mathematics a difference of .84, almost a standard deviation is found between these two groups.

Effect size analysees are also utilized for the Physics-Pretest. When effect size analysis is done on the ratio of the difference between the means of ML+UPI and ML groups in relation to the standard deviation of the ML group for the Pre-test on Physics, a difference of .84, almost a standard deviation is found between these two groups. Similarly, when effect size analysis is done on the ratio of the difference between the means of UPI and ML groups in relation to the standard deviation of the ML group, a difference of .69, more than half a standard deviation is found between these two groups. When effect size analysis is calculated on the ratio of the difference between the means of ML+UPI and the control group in relation to the standard deviation of the control group for the Pre-test on Physics, a difference of 1.26 standard deviation is found between these two groups.

When effect size analysis is done on the ratio of the difference between the means of UPI and the control groups in relation to the standard deviation of the control

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1 $\frac{\bar{X}_{ML+UPI} - \bar{X}_{ML}}{S_{ML}}$

group, a difference of 1.2 standard deviation is found between these two groups. Finally effect size analysis is done on the ratio of the difference between the means of ML and the control groups in relation to the standard deviation of the control group, a difference of .43, almost half a standard deviation is found between these two groups.

Effect size analyses are further carried out for the Chemistry Pre-test. When effect size analysis is done on the ratio of the difference between the means of ML+UPI and the ML groups in relation to the standard deviation of the ML group for the Chemistry Pre-test, a difference of .98, almost a standard deviation is found between these two groups. When effect size analysis is done on the ratio of the difference between the means of ML+UPI group and the control groups in relation to the standard deviation of the control group, a difference of 1.05 standard deviation is found between these two groups. Lastly, when effect size analysis is done on the ratio of the difference between the means of ML+UPI and UPI groups in relation to the standard deviation of the UPI group, a difference of .68, half a standard deviation above is found between these two groups.

As the results of the analyses show, the groups significantly differ from one another in terms of the first semester's curriculum for the subject areas of Mathematics, Physics and Chemistry before the implementation of the

Mastery Learning Method. According to these results, the first hypothesis of the study is rejected.

The second hypothesis of the study is:

HYPOTHESIS 2: THERE WILL BE A SIGNIFICANT EFFECT OF MASTERY LEARNING AND METHOD OF INSTRUCTION AND PRIVATE UNIVERSITY PREPARATORY INSTITUTION ATTENDANCE ON THE PARALLEL FORMS OF THE PRE-TESTS IN MATHEMATICS, PHYSICS AND CHEMISTRY.

In order to test this hypothesis, a two-way analysis of variance, Newman-Keuls analysis, t-test analyses, E correlation ratios and effect size analyses are used. Each of these analyses is carried out for the parallel forms of the Mathematics, Physics and Chemistry Pre-tests. Table 15 shows the two-way ANOVA test done on the parallel forms of the Mathematics, Physics and Chemistry Pre-tests.

TABLE 15. Two-way Analysis of Variance of the Effects of Mastery Learning Method of Instruction and Private University Preparatory Institution Attendance on the Parallel Forms of The Mathematics, Physics and Chemistry Pre-tests.

	MATHEMATICS		PHYSICS		CHEMISTRY	
	F	Significance Level	F	Significance Level	F	Significance Level
ML	41.069	p< .0001	72.038	p< .0001	34.270	p< .0001
UPI	5.186	p< .024	29.423	p< .0001	3.234	p< .075
MLxUPI Interaction	.550	.460 N.S.	3.195	.076 N.S.	.025	.875 N.S.

Table 15 shows that Mastery Learning Method of Instruction affects achievement on the Parallel Form of the Mathematics Pre-test at the .0001 level with an F value of 41.06. Results of Table 15 also show that attending Private University Preparatory Institution affects achievement on this test at the .02 significance level. As can be seen from the table, Mastery Learning has a greater impact than attending Preparatory Institutions on the achievement in terms of the parallel form of the Mathematics Pre-test both being highly significant. Table 15 also demonstrates that MLxUPI interaction is not significant. For the parallel form of the Physics Pre-test, both of the interventions have significant effects on the achievement levels. It is noteworthy that Mastery Learning affects achievement at the .0001 level of significance with on F value of 72.038 while attending Private University Preparatory Institutions again affects achievement at the same significance level with an F value of 29.423. For the parallel form of the Chemistry Pre-test, Mastery Learning has a graat impact on achievement at the .0001 significance level attending Preparatory Institutions do not have any significant effects. Moreover, MLxUPI interaction is insignificant.

The parallel forms of the Mathematics, Physics and Chemistry Pre-test scores of the four groups are compared with each other by the use of the Newman-Keuls formula. Table 16 gives these comparisons of the four groups.

TABLE 16. Comparison of the Parallel Forms of the Mathematics, Physics and Chemistry Pre-test Scores of the Four Groups, using the Newman Keuls formula.

	ML+UPI (1)		ML (2)		UPI (3)		Control (4)		Calculated q	Significance Level
	DF	MS error	DF	MS error	DF	MS error	DF	MS error		
Mathematics	131	12.937	131	12.937	131	12.937	131	12.937	1>3 5.69 1>4 8.60 2>3 4.26 2>4 4.59 3>4 2.92	1>3 $q_{r\alpha}$<.01 1>4 $q_{r\alpha}$<.01 2>3 $q_{r\alpha}$<.01 2>4 $q_{r\alpha}$<.01 3>4 $q_{r\alpha}$<.01 1>2 N.S.
Physics	128	6.884	128	6.884	128	6.884	128	6.884	1>2 3.42 1>3 6.95 1>4 13.98 2>3 3.52 2>4 10.56 3>4 7.03	1>2 $q_{r\alpha}$<.05 1>3 $q_{r\alpha}$<.05 1>4 $q_{r\alpha}$<.01 2>3 $q_{r\alpha}$<.05 2>4 $q_{r\alpha}$<.01 3>4 $q_{r\alpha}$<.01
Chemistry	125	11.116	125	11.116	125	11.116	125	11.116	1>3 5.49 1>4 7.38 2>3 3.93 2>4 5.81	1>3 $q_{r\alpha}$<.01 1>4 $q_{r\alpha}$<.01 2>3 $q_{r\alpha}$<.01 2>4 $q_{r\alpha}$<.01 1>2 N.S. 3>4 N.S.

As the findings for the parallel form of the Mathematics Pre-test suggest, there is a significant difference at the .01 level when ML+UPI and control groups are compared. Similarly, the difference is significant at the .01 level, when ML group is compared to the control group. When UPI and control groups are compared, the difference is significant at the same level. When ML+UPI and UPI groups are compared, there is again a difference at the

.01 level of significance. Finally, when ML and UPI groups are compared, a difference is found at the same significance level. As far as the Physics is concerned, when ML+UPI group is compared to the control group, the difference is significant at the .01 level. When ML and control groups are compared, there is again a significant difference at the same level. There is a significant difference at the .01 level, when UPI and control groups are compared. When ML+UPI and UPI groups are compared, the difference is significant at the .05 level. The difference is again significant at the same level when ML and UPI groups are compared. Finally, when ML+UPI and ML groups are compared, there is a significant difference at the .01 level. For the parallel form of the Chemistry Pre-test, when ML+UPI and control groups are compared, the difference is significant at the .01 level. When ML and control groups are compared, there is a significant difference at the same level. When ML+UPI group is compared to UPI group, there is a difference at the same significance level. Lastly, when ML group and UPI groups are compared, there is a difference at the .01 level.

T-test analyses for the Parallel Forms of the Mathematics, Physics and Chemistry Pre-tests are further utilized for comparison purposes.

TABLE 17. Comparison of the Means of the Parallel Forms of the Mathematics, Physics and Chemistry Pre-tests of the Four Groups, using t-test analyses.

	NL + UPI (1)			NL (2)			UPI (3)			Control (4)			t-value	Significance Level
	$\bar{X}$	S_d	n	$\bar{X}$	S_d	n	$\bar{X}$	S_d	n	$\bar{X}$	S_d	n		
Mathematics	13.1500	4.400	40	12.2381	3.604	21	9.5116	3.261	20	7.6452	2.787	31	1>3 = 4.30 1>4 = 6.08 2>3 = 3.03 2>4 = 5.18 3>4 = 1.96	1>3 p<.0001 1>4 p<.0001 2>3 p<.01 2>4 p<.0001 3>4 p<.05 1>2 N.S.
Physics	14.8462	2.072	39	13.2381	3.208	21	11.5814	2.575	43	8.2759	2.890	29	1>2 = 2.36 1>3 = 6.28 1>4 =10.93	1>2 p<.05 1>3 p<.0001 1>4 p<.0001 2>3 p<.05 2>4 p<.0001 3>4 p>.0001
Chemistry	16.0290	2.853	37	15.0526	3.808	19	12.6190	3.609	42	11.4516	3.171	31	1>3 = 4.61 1>4 = 6.26 2>3 = 2.40 2>4 = 3.61	1>3 p<.0001 1>4 p<.0001 2>3 p<.05 2>4 p<.001 1>2 N.S. 3>4 N.S.

The results of Table 17, using t-tests are in accordance with the results obtained from the Newman-Keuls formula. The mean performances of the ML+UPI, ML and UPI groups in comparison to the control group are significantly different. As can be seen from Table 17, the mean performances of ML+UPI and ML groups are significantly higher than the mean performances of the UPI and control groups on the parallel form of the Mathematics Pre-test. As far as the parallel form of the Physics Pre-test is concerned, there are again significant differences between the means of the three different interventions, namely ML+UPI, ML and UPI in comparison to the control group. Moreover, the group having both interventions, ML+UPI is significantly higher than all of the other groups followed by the ML group and UPI group, respectively. For the parallel form of the Chemistry Pre-test, ML+UPI group has the highest mean of all the groups. The second group which also has a high mean on the parallel form of the Chemistry Pre-test is the ML group. Because there is not much difference between the mean performances of these two groups, they do not significantly differ from one another. However, when ML+UPI and control groups are compared, the difference is significant at the .0001 level. Similarly, when ML group is compared to the control group, the difference is significant at the .001 level. There is a significant difference between ML+UPI and UPI groups at the .0001 level. Finally, when ML and UPI groups are compared,

the difference is significant at the .05 level. In short, ML+UPI and ML groups score significantly higher on this test than UPI and control groups.

E correlation ratios are also computed from the two-way ANOVA results. The following table shows the E correlation ratios and the amount of variance accounted for by each intervention in terms of the parallel forms of the Mathematics, Physics and Chemistry Pre-tests.

TABLE 18. E Correlation Ratios and the Amount of Variance Accounted for by Mastery Learning Method of Instruction and Private University Preparatory Institution Attendance for the Parallel Forms of the Mathematics, Physics and Chemistry Pre-tests.

	ML		UPI		multiple E Correlation ratio	
	E Correlation Ratios	Amount of Variance Accounted for (%)	E Correlation Ratios	Amount of Variance Accounted for (%)	E Correlation Ratios	Amount of Variance Accounted for (%)
Mathematics	.481	.231	.171	.029	.509	.259
Physics	.556	.309	.356	.126	.660	.436
Chemistry	.459	.211	.141	.019	.480	.231

For the parallel form of the Mathematics Pre-test, Mastery Learning accounts for 23% of the variation in achievement while Private University Preparatory

Institution Attendance accounts for 2.9% of the variation in achievement. Together, the two variable account for 25.9% of the variation in achievement. As far as the Physics is concerned, Mastery Learning alone account for 31%, whereas attending Private University Preparatory Institution account for 13% of the variation in achievement. The two interventions account for 44% of the variation in achievement on the parallel form of the Physics Pre-test. For the parallel form of the Chemistry Pre-test, Mastery Learning accounts for 21% of the variation in achievement on this test while Private University Preparatory Institution Attendance accounts for 2% of the variation in achievement. Together, they account for 23% of the variation.

Effect size analyses are also carried out to test the second hypothesis of the study. For the parallel form of the Mathematics Pre-test, when effect size analysis is done on the ratio of the difference between the means of ML+UPI and control groups, in relation to the standard deviation of the control group, a difference of 1.975, almost 2 standard deviations is found between these two groups. When effect size analysis is done on the ratio of the difference between the mean of ML and the control groups in relation to the standard deviation of the control group, a difference of 1.648 standard deviation is found between these two groups.

When effect size analysis is done on the ratio of the difference between UPI and the control groups in relation to

the standard deviation of the control group, a difference of .669, more than half a standard deviation is found between these two groups. When effect size analysis is done on the ratio of the difference between the means of ML+UPI and UPI groups in relation to the standard deviation of the UPI group, a difference of 1.115 standard deviation is found between these two groups. Finally, when effect size analysis is done on the ratio of the difference between the means of ML and UPI groups in relation to the standard deviation of the UPI group, a difference of .835, almost a standard deviation is found between these two groups.

Effect size analyses are also utilized in relation to the parallel form of the Physics Pre-test. When effect size analysis is done on the ratio of the difference between the means of ML+UPI and the control groups in relation to the standard deviation of the control group, a difference of 2.27 standard deviation is found between these two groups. When effect size analysis is done on the ratio of the difference between the means of ML and control groups in relation to the standard deviation of the control group, a difference of 1.716 standard deviation is found between these two groups. When effect size analysis is done on the ratio of the difference between the means of UPI and control groups in relation to the standard deviation of the control group, a difference of 1.143 standard deviation is found between these two groups. When effect size analysis is done on the ratio of the difference between the means of ML+UPI

and UPI groups in relation to the standard deviation of the UPI group, a difference of 1.267 standard deviation is found between these two groups. When an effect size analysis is computed on the ratio of the difference between the means of ML and UPI groups in relation to the standard deviation of the UPI group, a difference of .64, more than half a standard deviation is found. Finally, a difference of .501, half a standard deviation is found, when the same analysis is done on the ratio of the difference between the means of ML+UPI and ML groups in relation to the standard deviation of the ML group.

Effect size analyses are also computed for the parallel form of the Chemistry Pre-test. When an effect size analysis is done on the ratio of the difference between the means of ML+UPI and control groups in relation to the standard deviation of the control group, a difference of 1.442 standard deviation is found between these two groups.

When effect size analysis is done on the ratio of the difference between the means of ML and the control groups in relation to the standard deviation of the control group, a difference of 1.135 standard deviation is found between these two groups. When effect size analysis is done on the ratio of the difference between the means of ML+UPI and UPI groups in relation to the standard deviation of the UPI group, a difference of .904, almost a standard deviation is found between these two groups. When effect size analysis is

done on the ratio of the difference between the means of ML and UPI groups in relation to the standard deviation of the UPI group, a difference of .674, more than half a standard deviation is found between these two groups.

According to the results obtained from the analyses, Mastery Learning Method of Instruction and Private University Preparatory Institution attendance make a significant difference on the Parallel Forms of the Mathematics, Physics and Chemistry Pre-tests, the effect of Mastery Learning alone being much more sizeable than the effect of Private University Preparatory Institution attendance. Thus, the second hypothesis of the study is clearly confirmed.

The third hypothesis of the study is:

HYPOTHESIS 3: THERE WILL BE A SIGNIFICANT EFFECT OF MASTERY LEARNING METHOD OF INSTRUCTION AND PRIVATE UNIVERSITY PREPARATORY INSTITUTION ATTENDANCE ON THE MATHEMATICS, PHYSICS AND CHEMISTRY SUMMATIVE TESTS.

A two-way analysis of variance, the Newman-Keuls formula, t-test analyses, E correlation ratios and effect size analyses are the statistics utilized to test the third hypothesis of the study. All of these analyses are done for the Mathematics, Physics and Chemistry Summative Tests separately. Table 19 gives the two-way ANOVA test done for the Mathematics, Physics and Chemistry Summative Tests

investigating the effects of Mastery Learning and Private University Preparatory Institutions Attendance.

TABLE 19. Two-way Analysis of Variance of the Effects of Mastery Learning Method of Instruction and Private University Preparatory Institution Attendance on the Mathematics, Physics and Chemistry Summative Tests.

	MATHEMATICS		PHYSICS		CHEMISTRY	
	F	Significance Level	F	Significance Level	F	Significance Level
ML	6.456	.012	4.508	.036	3.835	.052
UPI	5.534	.020	.625	.431 N.S.	4.011	.047
MLxUPI Interaction	1.330	.251 N.S.	.267	.606 N.S.	.550	.460 N.S.

As can be seen from Table 19, Mastery Learning affects achievement on the Mathematics Summative Tests at the .01 level. Attending Private University Preparatory Institutions has an impect on achievement at the .02 level of significance. For the Physics Summative Test, Mastery Learning affects achievement at the .036 level of significance whereas Private University Preparatory Institution Attendance has no significant effect on the achievement. As far as the Chemistry Summative Test is concerned, Mastery Learning Method of Instruction has an effect on achievement at the .05 level while attending the

Private University Preparatory Institution has an impact on achievement at the .047 level of significance.

Mathematics, Physics and Chemistry Summative Test scores of the groups are compared by utilizing the Newman Keuls formula. Table 20 gives the Newman-Keuls results of the four groups.

TABLE 20. Comparison of the Mathematics, Physics and Chemistry Summative Test Scores of the Four Groups, using the Newman-Keuls formula.

	ML+UPI (1))		ML (2)		UPI (3)		Control (4)		Calculated q	Significance Level
	DF	MS error	DF	MS error	DF	MS error	DF	MS error		
Mathematics	132	275.267	132	275.267	132	275.267	132	275.267	1>4 4.94 2>4 3.91 3>4 3.34	1>4 $q_{r\alpha}$(.01 2>4 $q_{r\alpha}$(.05 3>4 $q_{r\alpha}$(.05 1>2 N.S. 1>3 N.S. 2>3 N.S.
Physics	132	135.346	132	135.346	132	135.346	132	135.346		1>2 N.S. 1>3 N.S. 1>4 N.S. 2>3 N.S. 2>4 N.S. 3>4 N.S.
Chemistry	132	157.616	132	157.616	132	157.616	132	157.616	1>4 3.94 2>4 3.02 3>4 2.61	1>4 $q_{r\alpha}$(.05 2>4 $q_{r\alpha}$(.05 3>4 $q_{r\alpha}$(.05 1>2 N.S. 1>3 N.S. 2>3 N.S.

As Table 20 suggests, ML+UPI group is significantly different from the control group at the .01

level for the Mathematics Summative Test. When ML is compared to the control group, the difference is significant at the .05 level. Similarly, when UPI and control groups are compared, the difference is again significant at the same level. The rest of the comparisons show insignificant differences. As far as the Physics Summative Test is concerned, no two groups are significantly different from each other. Finally, for the Chemistry Summative Test, ML+UPI group is significantly different from the group at the .05 level. When ML group is compared to the control group, the difference approaches significance at the .05 level. Likewise, there is a difference approaching significance at the same level when UPI and control groups are compared.

T-test are the next analyses that are carried out for comparing the four groups. Table 21 gives these comparisons for the Mathematics, Physics and Chemistry Summative Tests.

TABLE 21. Comparison of the Means of the Mathematics, Physics and Chemistry Summative Tests of the Four Groups, using t-test analyses.

	ML + UPI (1)			ML (2)			UPI (3)			Control P(4)			t-value	Significance Level
	$\bar{X}$	S_d	n	$\bar{X}$	S_d	n	$\bar{X}$	S_d	n	$\bar{X}$	S_d	n		
Mathematics	68.1951	18.663	41	65.1429	9.178	21	63.4651	19.634	43	53.5806	12.285	31	1>4 = 4.00 2>4 = 3.67 3>4 = 2.66	1>4 p<.0001 2>4 p<.001 3>4 p<.01 1>2 N.S. 1>3 N.S. 2>3 N.S.
Physics	55.5122	12.476	41	55.0952	6.495	21	52.0465	14.226	43	49.4839	8.748	31	1>4 = 2.30 2>4 = 2.51	1>4 p<.05 2>4 p<.05 1>2 N.S. 1>3 N.S. 2>3 N.S. 3>4 N.S.
Chemistry	59.0976	14.651	41	56.5238	7.068	21	56.0930	14.351	43	50.1935	9.257	31	1>4 = 3.15 2>4 = 2.65 3>4 = 2.01	1>4 p<.01 2>4 p<.05 3>4 p<.05 1>2 N.S. 1>3 N.S. 2>3 N.S.

For the Mathematics Summative Test, ML+UPI group has the highest mean performance of all the groups, followed by ML and UPI groups, respectively. The findings also show that the three different intervention groups, namely; ML+UPI, ML and UPI are significantly different from the control group. Although there are no significant differences between the groups when the Newman-Keuls statiss is utilized for the Physics Summative Test, significant differences are obtained from the t-test analyses. The reason for this distinction is because t-tests are more sensitive to differences between groups. Moreover, Newman-Keuls test is a more rigorous statistics in comparison to t-test analysees. Thus, unlike the results of the Newman-Keuls formula, there are some groups which are significantly different from others according to t-test findings. First of all, ML+UPI and ML groups have similar mean performances, 55.5 and 55.1, respectively. ML+UPI and ML groups are significantly different from the control group on the Physics Summative Test. As far as the Chemistry Summative Test is concerned, the mean of the ML+UPI group is the highest of all the groups followed by ML group and UPI group, respectively. The control group has the lowest mean on the Chemistry Summative Test. As can be seen from the Table, the groups that receive three different interventions; ML+UPI, ML and UPI groups are significantly different from the control group.

E correlation ratios are calculated from the results of two-way ANOVA for the Mathematics, Physics and

Chemistry Summative Tests. The following table shows the E correlation ratios and the amount of variance accounted for by each independent variable.

TABLE 22. E Correlation Ratios and the Amount of Variance Accounted for by Mastery Learning Method of Instruction and Private University Preparatory Institution Attendance for the Mathematics, Physics and Chemistry Summative Tests.

	ML		UPI		Multiple E Correlation Ratio	
	E Correlation Ratios	Amount of Variance Accounted for (%)	E Correlation Ratios	Amount of Variance Accounted for (%)	E Correlation Ratios	Amount of Variance Accounted for (%)
Mathematics	.211	.044	.195	.038	.287	.082
Physics	.181	.033	.067	.005	.193	.037
Chemistry	.165	.027	.169	.029	.236	.056

As Table 22 demonstrates, Mastery Learning alone accounts for 4% of the variation in achievement on the Mathematics Summative Test. Similarly, attending the Private University Preparatory Institutions accounts for also 4% of the variation on this test. As far as the Physics Summative Test is concerned, Mastery Learning alone accounts for 3% of the variation in achievement whereas Private University Preparatory Institution Attendance alone does not explain much. Mastery Learning alone accounts for 3% of the

variation in achievement on the Chemistry Summative test while attending the Private University Preparatory Institutions alone also accounts for 3% of the variation. Moreover, the effects of the two independent variables on all of the summative tests are additive.

Finally, effect size analyses are calculated for the three Summative Tests in the related subject areas. For the Mathematics Summative Test, when effect size analysis is done on the ratio of the difference between the means of ML+UPI and the control groups, in relation to the standard deviation of the control group, a difference of 1.189 standard deviations is found between the two groups. When an effect size analysis is done on the ratio of the difference between the means of ML and control groups, in ratios to the standard deviation of the control group, a difference of .94, almost a standard deviation is found between these two groups. When an effect size analysis is done on the ratio of the difference between the means of UPI and control groups in relation to the standard deviation of the control group, a difference of .81, a little less than a standard deviation is found between these two groups.

Effect size analyees are also carried out for the Physics Summative Test. When an effect size analysis is done on the ratio of the difference between the means of ML+UPI and control groups in relation to the standard deviation of

the control group, a difference of .689, more than half a standard deviation is found between these two groups.

When effect size analysis is done on the ratio of the difference between the means of ML and control groups in relation to the standard deviation of the control group, a difference of .641, more than half a standard deviation is found between these two groups.

Finally, effect size analyses are also computed for the Chemistry Summative Test. When effect size analysis is done on the ratio of the difference between the means of ML+UPI and the control groups in relation to the standard deviation of the control group, a difference of .96, almost a standard deviation is found between these two groups.

When effect size analysis is done on the ratio of the difference between the means of ML and control groups, in relation to the standard deviation of the control class, a difference of .68 more than half a standard deviation is found between these two groups. When effect size analysis is computed on the ratio of the difference between the means of UPI and the control groups, in relation to the standard deviation of the control group, a difference of .64, more than half a standard deviation is found between these two groups.

Thus, the results show that both Mastery Learning Method of Instruction and Private University Preparatory

Institution attendance affect achievement on the Mathematics, Physics and Chemistry Summative Tests significantly. The usual trend is that the group instructed under Mastery Learning Method of Instruction and attending the Private University Preparatory Institution is significantly different from the control group, followed by the ML and UPI groups, respectively. According to these findings, the third hypothesis of the study is strongly confirmed.

The fourth hypothesis of the study is:

HYPOTHESIS 4: THERE WILL BE A SIGNIFICANT EFFECT OF PRIVATE UNIVERSITY PREPARATORY INSTITUTION ATTENDANCE AND MASTERY LEARNING METHOD OF INSTRUCTION ON THE MATHEMATICS AND SCIENCE TESTS SIMILAR TO THOSE GIVEN ON THE STUDENT PLACEMENT EXAMINATION (ÖYS, 1986).

A two-way analysis of variance, the Newman-Keuls formula, t-test analyses, E correlation ratios and effect size analyses are utilized to test the fourth hyporhesis of the study. These analyses are carned out for both of the Mathematics and Science Tests that are similar to those given on ÖYS (1986). Table 23 gives the two-way ANOVA test done on the Mathematics and Science Tests similar to the ones given on ÖYS (1986).

TABLE 23. Two-way Analysis of Variance of the Effects of Mastery Learning Method of Instruction and Private University Preparatory Institution Attendance on the Mathematics and Science Tests Similar to Those Given on the Student Placement Examination (OYS, 1986).

	MATHEMATICS		SCIENCES	
	F	Significance Level	F	Significance Level
ML	.402	.527 N.S.	.575	.450 N.S.
UPI	12.614	.001	12.873	.0001
MLxUPI Interaction	.009	.924 N.S.	.155	.694 N.S.

The table demonstrates that Private University Preparatory Institution Attendance affects achievement on the Mathematics and Science Tests similar to those given on OYS (1986) significantly while Mastery Learning does not have an effect on achievement. Moreover, the ML and UPI interaction is not significant.

The Newman-Keuls statistics is used to compare the four groups with each other. Table 24 gives these comparisons of the four groups.

TABLE 24. Comparison of the Scores of the Mathematics and Science Tests Similar to Those Given on the Student Placement Examination (OYS, 1986) of the Four Groups, using the Newman-Keuls formula.

	ML+UPI (1)		UPI (2)		ML (3)		Control (4)		Calculated q	Significance Level
	DF	MS error	DF	MS error	DF	MS error	DF	MS error		
Mathematics	132	21.080	132	21.080	132	21.080	132	21.080	1>3 3.41 1>4 4.15 2>4 3.60	1>3 $q_{r\alpha}$(.05 1>4 $q_{r\alpha}$(.05 2>4 $q_{r\alpha}$(.05 1>2 N.S. 2>3 N.S. 3>4 N.S.
Science	132	38.376	132	38.376	132	38.376	132	38.376	1>3 3.99 1>4 4.23 2>3 2.96	1>3 $q_{r\alpha}$(.05 1>4 $q_{r\alpha}$(.05 2>3 $q_{r\alpha}$(.05 2>4 $q_{r\alpha}$(.05 1>2 N.S. 3>4 N.S.

Table 24 shows that ML+UPI group is significantly different from the control group at the .05 level on the Mathematics Test. The difference is again significant at the same level when UPI and groups are compared. When ML+UPI and ML groups are compared, there is a difference at the .05 level of significance. For the Science Test, when ML+UPI and control groups are compared, the difference is significant at the .05 level. Similarly, there is again a significant difference at the .05 level, when UPI group is compared to the control group. The difference is significant at the same level when ML+UPI and ML groups are compared. Finally, when

UPI and ML groups are compared, the groups significantly differ from one another at the .05 level.

T-test are utilized for further comparison purposes. Table 25 shows the t-tests between the four groups.

TABLE 25. Comparison of the Means of the Mathematics and Science Tests Similar to Those Given on the Student Placement Examination (GYS, 1986) of the Four Groups, using t-test Analyses.

	ML + UPI (1)			UPI (2)			ML (3)			Control P(4)			t-value	Significance Level
	$\bar{X}$	S_d	n	$\bar{X}$	S_d	n	$\bar{X}$	S_d	n	$\bar{X}$	S_d	n		
Mathematics	20.5610	4.522	41	20.1163	5.301	41	17.7619	4.392	21	17.1613	3.643	31	1>3 = 2.33 1>4 = 3.43 2>4 = 2.68	1>3 p<.05 1>4 p<.001 2>4 p<.01 1>2 N.S. 2>3 N.S. 3>4 N.S.
Science	78.9512	6.648	41	27.8140	7.011	43	24.5738	5.259	21	24.2581	4.761	31	1>3 = 3.33 1>4 = 3.33 2>3 = 2.10 2>4 = 2.44	1>3 p<.001 1>4 p<.001 2>3 p<.05 2>4 p<.05 1>2 N.S. 3>4 N.S.

The results of the t-test analyses shown in Table 25 are parallel to the results obtained from the Newman-Keuls formula. The ML+UPI and UPI groups score significantly higher than ML and control groups on the Mathematics Test. It is important to note that the mean performances of ML+UPI and UPI groups are similar. Moreover, the mean performance of the ML and control groups resemble one another. For the Science Test, the group under both interventions and the UPI alone group score significantly higher than the ML and control groups, the latter two again resembling one another on this test.

Based on the two-way ANOVA results, E correlation ratios are computed for the Mathematics and Science Tests similar to those given on BYS (1986). Table 26 gives the E correlation ratios and the amount of variance accounted for by each intervention.

TABLE 26. E Correlation Ratios and the Amount of Variance Accounted for by Mastery Learning Method of Instruction and Private University Preparatory Institution Attendance for the Mathematics and Science Tests Similar to Those Given on the Student Placement Examination (BYS, 1986).

	ML		UPI		Multiple E Correlation Ratio	
	E Correlation Ratios	Amount of Variance Accounted for (%)	E Correlation Ratios	Amount of Variance Accounted for (%)	E Correlation Ratios	Amount of Variance Accounted for (%)
Mathematics	.053	.003	.295	.087	.299	.089
Science	.063	.004	.297	.088	.304	.092

Table 26 shows that Private University Preparatory Institution Attendance alone accounted for 9% of the variation in achievement on both the Mathematics and Science Tests whereas Mastery Learning Method of Instruction does not account much.

Effect size analyses are also computed for the Mathematics and Science Tests similar to those given on BYS (1986). For the Mathematics Test, when effect size analysis is done on the ratio of the difference between the means of ML+UPI and the control group in relation to the standard deviation of the control group, a difference of .93, almost a standard deviation is found between these two groups.

When effect size analysis is done on the ratio of the difference between means of UPI and control groups in relation to the standard deviation of the control group, a difference of .81, again almost a standard deviation is found between those two groups. When effect size analysis is done on the ratio of the difference between the means of ML+UPI and ML groups in relation to the standard deviation of the ML group, a difference of .637 more than half a standard deviation is found between these two groups. When effect size analysis is done on the ratio of the difference between the means of UPI and ML groups in relation to the standard deviation of the ML group, a difference of .53, half a standard deviation is found between these two groups. For the Science Test, when effect size analysis is done on

the ratio of the difference between the means of ML+UPI and control groups in relation to the standard deviation of the control group, a difference of .985, almost a standard deviation is found between these two groups. When effect size analysis is done on the ratio of the difference between the means of UPI and control groups, in relation to the standard deviation of the control group, a difference of 0.507, half a standard deviation is found between these two groups. When effect size analysis is done on the ratio of the difference between the means of ML+UPI and ML groups, in relation to the standard deviation of the ML group, a difference of 0.84, almost a standard deviation is found between these two groups. Finally, when effect size analysis is done on the ratio of the difference between the means of UPI and ML groups in relation to the standard deviation of the ML group, a difference of .625, more than half a standard deviation is found between these two groups.

According to the results obtained from the analyses, Private University Preparatory Institution Attendance affects achievement on the Mathematics and Science Tests Similar to those given on the Student Placement Examination (OYS, 1986) significantly. On the other hand, the effect of the other intervention, namely, Mastery Learning is not significant. The results are such that ML+UPI and UPI groups score significantly different than ML and control groups on these two tests. Thus, the fourth hypothesis of the study is partially supported.

The fifth hypothesis of the study is:

HYPOTHESIS 5: THERE WILL BE A SIGNIFICANT EFFECT OF PRIVATE UNIVERSITY PREPARATORY INSTITUTION ATTENDANCE AND MASTERY LEARNING METHOD OF INSTRUCTION ON THE TEST GIVEN BY THE ASSOCIATION OF PRIVATE UNIVERSITY PREPARATORY INSTITUTIONS (ÖZDEBİR, 1987).

In order to test this hypothesis of the study, two-way ANOVA, the Newman-Keuls formula, t-tests, E correlation ratios and effect size analyses are utilized. Table 27 gives the two-way ANOVA test done on the Test given by the Association of Private University Prepatatory Institutions (Özdebir, 1987).

TABLE 27. Two-way Analysis of Variance of the Effects of Mastery Learning Method of Instruction and Private University Preparatory Institution Attendance on the Test Given by the Association of Private University Preparatory Institutions (Özdebir, 1987).

SOURCE	Sum of Scores	DF	MS	F	Significance Level
ML	108.173	1	108.173	.162	.689 N.S.
UPI	3231.873	1	3231.873	4.850	.032
ML×UPI Interaction	186.903	1	186.903	.280	.598 N.S.
ERROR	37980.498	57	666.325	-	-

Table 27 shows that Private University Preparatory Institution attendance has an effect on achievement at the

.032 level of significance. On the other hand, the impact of Mastery Learning Method of Instruction on the Test given by the Association of Private University Preparatory Institutions (Özdebir, 1987) is not significant. As can be seen from the table, ML and UPI interaction is also not significant.

The Newman-Keuls technique is the statistics used to compare the groups with each other. Table 28 gives the comparisons between the four groups.

TABLE 28. Comparison of the Scores of the Test Given by the Association of Private University Preparatory Institutions (Özdebir, 1987) of the four groups, using the Newman-Keuls formula.

	DF	MS Error	Calculated q	Significance Level
ML+UPI (1)	57	666.325	1>2 0.44 1>3 1.35 1>4 1.98	1>2 N.S. 1>3 N.S. 1>4 N.S.
UPI (2)	57	666.325	2>3 1.78 2>4 2.41	2>3 N.S. 2>4 N.S.
ML (3)	57	666.325	3>4 0.63	3>4 N.S.
Control (4)	57	666.325	-	-

According to the results, no two groups are significantly different from one another on the Test given

by the Association of Private University Preparatory Institutions (Özdebir, 1987).

T-test analyses are further carried out for comparison purposes. Table 29 gives the t-tests for this test.

TABLE 29. Comparison of the Means of the Test Given by the Association of Private University Preparatory Institutions (Özdebir, 1987) of the Four Groups, using t-test analyses.

	Mean	Standard Deviation	Number	t-value	Significance Level
ML+UPI (1)	168.386	25.408	23	1>4 = 1.70	1>4 p<.05 2>1 N.S. 1>3 N.S.
UPI (2)	172.549	28.511	28	2>4 = 2.07	2>4 p<.05 2>3 N.S.
ML (3)	155.54	19.055	3	-	3>4 N.S.
Control (4)	149.485	13.562	7	-	-

As can be seen from Table 29, the mean performance of the UPI group is the highest of all the groups, followed by ML+UPI and ML groups reespectively. UPI and ML+UPI groups score significantly higher than the control group on the Test given by the Association of Private University Preparatory Institutions (Özdebir, 1987).

E correlation ratios are also computed to test the fifth hypothesis of the study. Table 30 gives the E correlation ratios and the amount of variation accounted for by each independent variable.

TABLE 30. E Correlation Ratios and the Amount of Variance Accounted for by Mastery Learning Method of Instruction and Private University Preparatory Institution Attendance for the Test Given by the Association of Private University Preparatory Institutions (Özdebir, 1987).

	E Correlation Ratios	Amount of Variance Accounted for (%)
ML and Achievement	.051	.0026
UPI and Achievement	.279	.078
Multiple E Correlation Ratios	.283	.080

According to the findings in Table 30, Private University Preparatory Institution Attendance alone accounts for about 8% of the variation in achievement while Mastery Learning does not explain much (.2%).

The final analyses that are utilized for the Test given by the Association of Private University Preparatory Institutions (Özdebir, 1987) are the effect size analyses. When effect size analysis is done on the ratio of the

difference between the means of ML+UPI and control groups in relation to the standard deviation of the control group, a difference of 1.393 standard deviation is found between these two groups. When effect size analysis is done on the ratio of the difference between the means of UPI and control groups in relation to the standard deviation of the control group, a difference of 1.70 standard deviation is found between these two groups. When effect size analysis is done on the ratio of the difference between the means of ML+UPI and ML groups in relation to the standard deviation of the ML group, a difference of .675, more than half a standard deviation is found between these two groups. When effect size analysis is done on the ratio of the difference between the means of UPI and ML groups in relation to the standard deviation of the ML group, a difference of .89, almost a standard deviation is found between these two groups. When effect size analysis is done on the ratio of the difference between the means of ML and control groups in relation to the standard deviation of the control group, a difference of .44, almost half a standard deviation is found between these two groups.

According to the results obtained from these analyses, attending Private University Preparatory Institutions has a sizeable effect on the Test given by Association of Private University Preparatory Institutions while the impact of Mastery Learning is insignificant. The

findings of these statistics partially support the fifth hypothesis of the study.

The sixth hypothesis of the study is:

HYPOTHESIS 6: THERE WILL BE A SIGNIFICANT EFFECT OF PRIVATE UNIVERSITY PREPARATORY INSTITUTION ATTENDANCE AND MASTERY LEARNING METHOD OF INSTRUCTION ON THE STUDENT SELECTION EXAMINATION (OSS, 1987).

Two-way analysis of variance, the Newman-Keuls statistics, t-tests, E correlation ratios and effect size analyses are carried out in order to test the sixth hypothesis of the study. Table 31 gives the two-way ANOVA test done on the Student Selection Examination (OSS, 1987).

TABLE 31. Two-way Analysis of Variance of the Effects of Mastery Learning Method of Instruction and Private University Preparatory Institution Attendance on the Student Selection Examination (OSS, 1987).

SOURCE	Sum of Squares	DF	MS	F	Significance Level
ML	101.408	1	101.408	.329	.567 N.S.
UPI	8111.896	1	8111.896	26.288	.0001
MLxUPI Interaction	10.381	1	10.381	.034	.855 N.S.
ERROR	40422.943	131	308.572	-	-

Table 31 illustrates that Private University Preparatory Institution attendance affects achievement on

the Student Selection Examination at the .0001 significance level. On the other hand, Mastery Learning Method of Instruction does not affect achievement significantly. Similarly, ML and UPI interaction is insignificant.

Newman-Keuls is the next appropriate statistic to compare the groups with each other. Table 32 gives the Newman-Keuls formula results.

TABLE 32. Comparison of the Student Selection Examination Scores (SSS, 1987) of the Four Groups, using the Newman-Keuls formula.

	DF	MS Error	Calculated q	Significance Level
ML+UPI (1)	131	308.572	1>3 4.84 1>4 4.52	1>3 $q_{r\alpha}$<.01 1>4 $q_{r\alpha}$<.01 2>1 N.S.
UPI (2)	131	308.572	2>3 5.53 2>4 5.20	2>3 $q_{r\alpha}$<.01 2>4 $q_{r\alpha}$<.01
ML (3)	131	308.572	-	4>3 N.S.
Control (4)	131	308.572	-	-

As the table demonstrates, ML+UPI and UPI groups are significantly different from ML and control groups on the Student Selection Examination (SSS, 1987).

The four groups that are under consideration in this study are again compared by the use of t-test analyses. Table 33 gives these comparisons.

TABLE 33. Comparison of the Means of the Student Selection Examination (SSS, 1987) Scores of the Four Groups, using t-tests.

	Mean	Standard Deviation	Number	t-value	Significance Level
ML+UPI (1)	130.124	19.650	41	1>3 = 3.28 1>4 = 3.39	1>3 p<.01 1>4 p<.001 2>1 N.S.
UPI (2)	132.303	19.472	42	2>3 = 3.78 2>4 = 3.94	2>3 p<.0001 2>4 p<.0001
ML (3)	114.781	11.789	21	-	4>3 N.S.
Control (4)	115.808	14.890	31	-	-

The findings of t-test analyses are similar to the results obtained from the Newman-Keuls formula. The table demonstrates that ML+UPI and UPI groups score significantly higher than ML and control groups on the Student Selection Examination (SSS, 1987).

Based on the findings of two-way ANOVA, E correlation ratios are computed for the Student Selection Examination (SSS, 1987). Table 34 gives the E correlation

ratios and the amount of variance accounted for by each intervention.

TABLE 34. E Correlation Ratios and the Amount of Variance Accounted for by Mastery Learning Method of Instruction and Private University Preparatory Institution Attendance for the Student Selection Examination (OSS, 1987).

	E Correlation Ratios	Amount of Variance Accounted for (%)
ML and Achievement	.046	.002
UPI and Achievement	.408	.167
Multiple E Correlation Ratios	.411	.169

Table 34 shows that Private University Preparatory Institution Attendance accounts for 17% of the variation in achievement whereas Mastery Learning does not account much of the variance on the Student Selection Examination (OSS, 1987).

Effect size analyses are the last analyses that are used to test the sixth hypothesis of the study. When effect size analysis is done on the ratio of the difference between the means of ML+UPI and control groups in relation to the standard deviation of the control group, a difference

of .96, almost a standard deviation is found between these two groups. When effect size analysis is done on the ratio of the difference between the means of UPI and control groups in relation to the standard deviation of the control class, a difference of 1.107 standard deviation is found between these two groups. When effect size analysis is done on the ratio of the difference between the means of ML+UPI and ML groups in relation to the standard deviation of the ML group, a difference of 1.301 standard deviation is found between these two groups. When effect size analysis is done on the ratio of the difference between the means of UPI and ML groups in relation to the standard deviation of the ML group, a difference of 1.486, almost 1.5 half standard deviation is found between these two groups.

As the results of these analyses suggest, Private University Preparatory Institution attendance has a sizeable effect on the Student Selection Examination (OSS, 1987) whereas the effect of Mastery Learning Method of Instruction is insignificant. Therefore, the sixth hypothesis of the study is partially supported.

The seventh hypothesis of the study is:

HYPOTHESIS 7: THERE WILL BE A SIGNIFICANT EFFECT OF PRIVATE UNIVERSITY PREPARATORY INSTITUTION ATTENDANCE AND MASTERY LEARNING METHOD OF INSTRUCTION ON THE SCIENCE SCORES OF THE STUDENT PLACEMENT EXAMINATION (ÖYS-FEN, 1987).

Two-way analysis of variance, the Newman-Keuls technique, t-tests, E correlation ratios and effect size analyses are the statistics used to investigate this hypothesis of the study. Table 35 gives the two-way analysis of variance test utilized for the science scores of the Student Placement Examination (ÖYS-Fen, 1987).

TABLE 35. Two-way Analysis of Variance of the Effects of Mastery Learning Method of Instruction and Private University Preparatory Institution Attendance on the Science Scores of the Student Placement Examination (ÖYS-Fen, 1987).

SOURCE	Sum of Squares	DF	MS	F	Significance Level
ML	5907.695	1	5907.695	1.065	.311 N.S.
UPI	136903.710	1	136903.710	24.683	.000
MLxUPI Interaction					
ERROR	149752.323	27	5546.382	-	-

Table 35 demonstrates that Private University Preparatory Institution attendance affects achievement on the Science Scores of the Student Placement Examination (ÖYS-Fen, 1987) at the .0001 level of significance. However, Mastery Learning Method of Instruction does not affect achievement on the science scores significantly. Moreover, since there are no students who have taken the science test in the group instructed under Mastery Learning Method of Instruction, in other words, due to the insufficient number of students in the four groups under consideration, ML and UPI interaction could not be calculated.

Newman-Keuls is the next appropriate analysis for comparison purposes. Table 36 gives the Newman-Keuls results between the four groups.

TABLE 36. Comparison of the Science Scores on the Student Placement Examination (ÖYS-Fen, 1987) of the Three Groups, using the Newman-Keuls formula.

	DF	MS Error	Calculated q	Significance Level
ML+UPI (1)	27	5546.382	1>4 7.28	1>4 $q_{r,\alpha}$<.01 2>1 N.s
UPI (2)	27	5546.382	2>4 8.13	2>4 $q_{r,\alpha}$<.01
ML (3)	-	-	-	-
Control (4)	27	5546.382	-	-

Table 36 illustrates that when ML+UPI and control groups are compared, there is a significant difference at the .01 level. The difference is again significant at the same level when UPI and control groups are compared. There is no significant difference between UPI and ML+UPI groups according to the findings of the Newman-Keuls statistics.

T-test analyses are used to further substantiate the findings of the Newman-Keuls formula. Table 37 gives the t-test results between the groups.

TABLE 37. Comparison of the Means of the Science Scores on the Student Placement Examination (OYS-Fen, 1987) of the Three Groups, using t-test analyses.

	Mean	Standard Deviation	Number	t-value	Significance Level
ML+UPI (1)	417.127	61.744	14	1>4 = 3.83	1>4 p<.01 2>1 N.S.
UPI (2)	446.178	58.677	14	2>4 = 4.37	2>4 p<.001
ML (3)	-	-	0	-	-
Control (4)	166.481	235.439	2	-	-

Table 37 shows that UPI group has the highest mean of all the groups on the Science Scores of the Student

Placement Examination (ÖYS-Fen, 1987). As the findings suggest, UPI and ML+UPI groups score significantly higher than the control group on the science scores of the second stage of the examination (ÖYS). It is noteworthy that none of the students in the ML group has taken this test on the ÖYS while only 2 students in the control group have taken this exam.

E correlation ratios are calculated on the basis of two-way ANOVA test for the science scores of the Student Placement Examination (ÖYS-Fen, 1987). E correlation ratios and the amount of variance accounted for by each independent variable are given on Table 38.

TABLE 38. E Correlation Ratios and the Amount of Variance Accounts for by Mastery Learning Method of Instruction and Private University Preparatory Institution Attendance for the Science Scores of the Student Placement Examination (ÖYS-Fen, 1987).

	E Correlation Ratios	Amount of Variance Accounted for (%)
ML and Achievement	.1421	.020
UPI and Achievement	.648	.468
Multiple E Correlation Ratios	.699	.488

Table 38 shows that attending Private University Preparatory Institutions alone accounts for 47% of the variation in achievement on the science scores of the Student Placement Examination (OYS-Fen, 1987), while Mastery Learning alone accounts for only 2% of the variation in achievement on the science scores. Together, those two independent variables explain 49% of the variance in achievement.

Effect size analyses are also calculated for the science scores of the Student Placement Examination (OYS-Fen, 1987). When effect size analysis is done on the ratio of the difference between the means of ML+UPI and control groups in relation to the standard deviation of the control group, a difference of 1.064 standard deviation is found between these two groups. When effect size analysis is done on the ratio of the difference between the means of UPI and control groups in relation to the standard deviation of the control group, a difference of 1.187 standard deviation is found between these two groups.

Attending the Private University Preparatory Institution affects achievement on the science scores of the Student Placement Examination according to the findings of these hypotheses significantly. On the other hand, the impact of Mastery Learning Method of Instruction is not significant. Thus, the seventh hypothesis of the study is partially supported.

The eighth hypothesis of the study is:

HYPOTHESIS 8: THERE WILL BE A SIGNIFICANT EFFECT OF PRIVATE UNIVERSITY PREPARATORY INSTITUTION ATTENDANCE AND MASTERY LEARNING METHOD OF INSTRUCTION ON THE MATHEMATICS SCORES OF THE STUDENT PLACEMENT EXAMINATION (OYS-MAT, 1987).

In order to test the eighth hypothesis of the study, two-way analysis of variance, the Newman-Keuls formula, t-tests, E correlation ratios and effect size analyses are carried out. Table 39 gives the two-way ANOVA test done for the mathematics scores of the Student Placement Examination (OYS-Mat, 1987).

TABLE 39. Two-way Analysis of Variance of the Effects of Mastery Learning Method Instruction and Private University Preparatory Institution Attendance on the Mathematics Scores of the Student Placement Examination (OYS-Mat, 1987).

SOURCE	Sum of Squares	DF	MS	F	Significance Level
ML	1144.697	1	1144.697	.283	.597 N.S.
UPI	56683.546	1	56683.546	13.994	.0001
MLxUPI Interaction	362.346	1	362.346	.089	.766 N.S.
ERROR	238977.898	59	4050.473	-	-

Table 39 shows that Private University Preparatory Institution Attendance has an effect on achievement at the .0001 level of significance with an F value of 13.996. The table also demonstrates that Mastery Learning Method of Instruction is not significant in relation to the achievement on the Mathematics Scores of the Student Placement Examination (OYS-Mat, 1987). Moreover, the interaction between ML and UPI is not significant.

The four groups that are under consideration in this study are compared by the use of the Newman-Keuls formula. Table 40 gives these comparisons.

TABLE 40. Comparison of the Mathematics Scores on the Student Placement Examination (OYS-Mat, 1987) of the Four Groups, using the Newman-Keuls formula.

	DF	MS Error	Calculated q	Significance Level
ML+UPI (1)	59	4050.473	1>3 3.82 1>4 2.93	1>3 $q_{r\alpha}$<.05 1>4 $q_{r\alpha}$<.05 2>1 N.S.
UPI (2)	59	4050.473	2>3 4.10 2>4 3.22	2>3 $q_{r\alpha}$<.05 2>4 $q_{r\alpha}$<.05
ML (3)	59	4050.473	-	3>4 N.S.
Control (4)	59	4050.473	-	-

Table 40 illustrates that when ML+UPI and Control groups are compared, the difference is significant at the .05 level. The difference approaches significance when UPI group is compared to the control group. Similarly, when ML+UPI and ML groups are compared, there is again a difference significant at the .05 level. Lastly, when UPI group is compared to the ML group, the difference is significant at the same level. In summary, UPI and ML+UPI groups score significantly higher than ML and control groups on the Mathematics scores of the Student Placement Examination (ÖYS-Mat, 1987).

T-test analyses are used for further comparison purposes. Table 41 gives the t-test results between the four groups for the Mathematics scores of the Student Placement Examination (ÖYS-Mat, 1987).

TABLE 41. Comparison of the Means of the Mathematics Scores on the Student Placement Examination (OYS-Mat, 1987) of the Four Groups, using t-test analyses.

	Mean	Standard Deviation	Number	t-value	Significance Level
ML+UPI (1)	412.433	66.697	25	1>3 = 2.22 1>4 = 2.72	1>3 p<.05 1>4 p<.01 2>1 N.S.
UPI (2)	419.105	65.875	26	2>3 = 2.42 2>4 = 3.04	2>3 p<.05 2>4 p<.01
ML (3)	324.803	28.245	3	-	3>4 N.S.
Control (4).	345.240	52.593	9	-	-

The results of Table 41 suggests that ML+UPI and UPI groups are significantly different from the ML and control groups on the Mathematics Scores of the Student Placement Examination (OYS-Mat, 1987).

E correlation ratios are calculated on the basis of two-way analysis of variance. Table 42 gives the E correlation ratios and the amount of variance accounted for by each intervention.

TABLE 42. E Correlation Ratios and the Amount of Variance Accounted for by Mastery Learning Method of Instruction and Private University Preparatory Institution Attendance for the Mathematics Scores of the Student Placement Examination (ÖYS-Mat, 1987).

	E Correlation Ratios	Amount of Variance Accounted for (%)
ML and Achievement	.062	.004
UPI and Achievement	.437	.190
Multiple E Correlation Ratios	.441	.194

As can be seen from the table, attending Private UNiversity Preparatory Institutions accounts alone for 19% of the variation in achievement on the Mathematics scores. On the other hand, Mastery Learning does not account much.

Effect size analyses are also computed for the Mathematics scores of the Student Placement Examination (ÖYS-Mat, 1987). When effect size analysis is done on the ratio of the difference between the means of ML+UPI and control groups in relation to the standard deviation of the control group, a difference of 1.277 standard deviation is found between these two groups. When effect size analysis is done on the ratio of the difference between the means of UPI and control groups in relation to the standard deviation of

the control group, a difference of 1.404, almost 1.5 half standard deviation is found between these two groups. When effect size analysis is done on the ratio of the difference between the means of ML+UPI and ML groups in relation to the standard deviation of the ML groups, a difference of 3.102 standard deviation is found between these two groups. When effect size analysis is done on the ratio of the difference between the means of UPI and ML groups in relation to the standard deviation of the ML group, a difference of 3.338 standard deviations is found between these two groups.

As can be seen from the results, Private University Preparatory Institution Attendance has a great impact on the Mathematics scores of the Student Placement Examination (ÖYS-Mat, 1987) whereas Mastery Learning does not affect achievement on the mathematics scores. According to these results, the eighth hypothesis of the study is partially supported.

The ninth hypothesis of the study is:

HYPOTHESIS 9: THERE WILL BE A SIGNIFICANT EFFECT OF PRIVATE UNIVERSITY PREPARATORY INSTITUTION ATTENDANCE AND MASTERY LEARNING METHOD OF INSTRUCTION ON THE COMBINED TURKISH/MATHEMATICS SCORES OF THE STUDENT PLACEMENT EXAMINATION (ÖYS-TM, 1987).

Two-way analysis of variance, the Newman-Keuls statistics, t-tests, E correlation ratios and effect size analyses are utilized to test the ninth hypothesis of the study. Table 43 shows the two-way ANOVA results for the combined Turkish/Mathematics scores of the Student Placement Examination (ÖYS-TM, 1987).

TABLE 43. Two-way Analysis of Variance of the Effect of Mastery Learning Method of Instruction and Private University Preparatory Institution Attendance on the Combined Turkish/Mathematics Scores of the Student Placement Examination (ÖYS-TM, 1987).

SOURCE	Sum of Squares	DF	MS	F	Significance Level
ML	2782.426	1	2782.426	.668	.417 N.S.
UPI	26975.904	1	26975.904	6.480	.014
MLxUPI Interaction	6592.038	1	6592.038	1.583	.214 N.S.
ERROR	212326.293	51	4163.261	-	-

Table 43 demonstrates that Private University Preparatory Institution attendance has an effect on achievement at the .01 level of significance with an F value of 6.48 for the combined Turkish and Mathematics scores of the Student Placement Examination (ÖYS-TM, 1987). THe table also shows that Mastery Learning Method of Instruction does not affect achievement significantly. Finally, as can be seen from the Table, the interaction between ML and UPI is not significant.

The Newman-Keuls formula are the next appropriate statistics to compare the four groups of the study. Table 44 gives these comparisons.

TABLE 44. Comparison of the Combined Turkish/Mathematics Scores on the Student Placement Examination (ÖYS-TM, 1987) of the Four Groups, using the Newman-Keuls formula.

	DF	MS Error	Calculated q	Significance Level
ML+UPI (1)	51	4163.261	1>4 3.85	1>4 $q_{r\alpha}$<.05 1>2 N.S. 1>3 N.S.
UPI (2)	51	4163.261	2>4 3.31	2>4 $q_{r\alpha}$<.05 2>3 N.S.
ML (3)	51	4163.261	-	3>4 N.S.
Control (4)	51	4163.261	-	-

As the table shows, when ML+UPI and control groups are compared, there is a significant difference at the .05 level. Similarly, the difference is significant at the same level, when UPI and control groups are compared.

T-tests are used to further confirm the findings of the Newman-Keuls formula. Table 45 gives these comparisons.

TABLE 45. Comparison of the Means of the Combined Turkish/Mathematics Scores on the Student Placement Examination (ÖYS-TM, 1987), of the Four Groups, using t-test analyses.

	Mean	Standard Deviation	Number	t-value	Significance Level
ML+UPI (1)	380.581	56.452	20	1>4 = 2.28	1>4 p<.05 1>2 N.S. 1>3 N.S.
UPI (2)	379.934	41.737	19	2>4 = 2.41	2>4 p<.05 2>3 N.S.
ML (3)	360.380	30.585	6	-	3>4 N.S.
Control (4)	310.392	113.402	10	-	-

Table 45 demonstrates that ML+UPI and UPI groups are significantly different from the control group. It should be noted that the mean performance of the ML+UPI and UPI groups are quite similar. An interesting finding on

t-test analyses is that the control group has a standard deviation of 113.402.

Based on the two-way analysis of variance, E correlation ratios are computed. Table 46 gives the E correlation ratios and the amount of variance accounted for by each independent variable.

TABLE 46. E Correlation Ratios and the Amount of Variance Accounted for by Mastery Learning Method of Instruction and Private University Preparatory Institution Attendance for the Combined Mathematics/Turkish Scores of the Student Placement Examination (OYS-TM, 1987).

	E Correlation Ratios	Amount of Variance Accounted for (%)
ML and Achievement	.106	.011
UPI and Achievement	.329	.108
Multiple E Correlation Ratios	.346	.119

The table shows that Private University Preparatory Institution attendance alone accounts for about 11% of the variance in achievement whereas only 1% of the variance in achievement is accounted for by Mastery Learning Method of Instruction. Together, these two variables account for about 12% of the variation in achievement on the

combined Turkish/Mathematics Scores of the Student Placement Examination (ÖYS-TM, 1987).

Effect size analyses are the last statistics done for the combined Turkish/Mathematics scores of the Student Placement Examination (ÖYS-TM, 1987). When effect size analysis is calculated on the ratio of the difference between the means of ML+UPI and control groups, in relation to the standard deviation of the control group, a difference of .618, more than half a standard deviation is found between these two groups.

When effect size analysis is computed on the ratio of the difference between the means of UPI and control groups, in relation to the standard deviation of the control group, a difference of .613, more than half a standard deviation is found between these two groups. When effect size analysis is done on the ratio of the difference between the means of ML+UPI and ML groups, in relation to the standard deviation of the ML group, a difference of .66, again more than half a standard deviation is found between these two groups. When effect size analysis is done on the ratio of the difference between the means of UPI and ML groups in relation to the standard deviation of the ML group, a difference of .639, more than half a standard deviation is found between these two groups. When effect size analysis is done on the ratio of the difference between the means of ML and control groups in relation to the standard deviation of the control group,

a difference of .44, almost half a standard deviation is found between these two groups.

As the findings demonstrate, attending Private University Preparatory Institution affects achievement on the combined Turkish/Mathematics scores of the Student Placement Examination (ÖYS-TM, 1987) whereas there is no effect of Mastery Learning Method of Instruction. Hence, the ninth hypothesis of the study is partially supported.

Correlation of Tests With One Another

Table 47 gives the Pearson Product Moment Correlation Coefficients of the achievement tests such as Pre-tests on Mathematics, Physics and Chemistry, their parallels, summative tests in the related subject areas and the measures related to university entrance examinations including the Mathematics and Science Tests similar to those given on the Student Placement Examination (ÖYS, 1986), a test given by the Association of Private University Preparatory Institutions (Özdebir, 1987), Student Selection Examination (ÖSS, 1987) and Student Placement Examination (ÖYS, 1987) with one another.

As the findings suggest, the tests related to content of the second semester's curriculum, in other words, the achievement tests, correlate highly with the tests related to Student Selection and Placement Examination (SSPE) and its equivalents. The fact that the tests correlate highly with one another may not indicate content validity. These correlations only indicate that students scoring high on measures related to school achievement also score highly on the Student Selection and Placement Examination. It is possible that a third variable is responsible for such high correlations.

TABLE 47. Pearson Product Moment Correlation Coefficients of the Achievement Tests and University Entrance Exam Measures.

	PreMat	PrePhys	PreChem	PrePar Mat	PrePar Phys	PrePar Chem	MatSum	PhysSum	ChemSum	BMT	BFBT	Özdebir	ÖSS	ÖYS-Fen	ÖYS-Mat	ÖYS-TM
PreMat	1.0000 (130) p= 0															
PrePhys	.3870 (127) p=.000	1.0000 (133) p= 0														
PreChem	.4278 (128) p=.000	.5173 (131) p=.000	1.0000 (134) p= 0													
PrePar Mat	.5709 (129) p=.000	.4724 (132) p=.000	.4832 (133) p=.000	1.0000 (135) p= 0												
PrePar Phys	.2667 (126) p=.001	.7266 (129) p=.000	.5144 (130) p=.000	.6164 (131) p=.000	1.0000 (132) p= 0											
PrePar Chem	.3258 (124) p=.000	.4895 (126) p=.000	.8997 (127) p=.000	.5222 (128) p=.000	.5292 (127) p=.000	1.0000 (129) p= 0										
MatSum	.4392 (130) p=.000	.4474 (133) p=.000	.5839 (134) p=.000	.5238 (135) p=.000	.5081 (132) p=.000	.5464 (129) p=.000	1.0000 (136) p= 0									
PhysSum	.4102 (130) p=.000	.4933 (133) p=.000	.7165 (134) p=.000	.4305 (135) p=.000	.5009 (132) p=.000	.6601 (129) p=.000	.7837 (136) p=.000	1.0000 (136) p= 0								
ChemSum	.3132 (130) p=.000	.5186 (133) p=.000	.5982 (134) p=.000	.3957 (135) p=.000	.5441 (132) p=.000	.5376 (129) p=.000	.6770 (136) p=.000	.7953 (136) p=.000	1.0000 (136) p= 0							
BMT	.4539 (130) p=.000	.5452 (133) p=.000	.6494 (134) p=.000	.4701 (135) p=.000	.4848 (132) p=.000	.5223 (129) p=.000	.8354 (136) p=.000	.7570 (136) p=.000	.7336 (136) p=.000	1.0000 (136) p=.000						
BFBT	.4149 (130) p=.000	.5246 (133) p=.000	.6369 (134) p=.000	.4164 (135) p=.000	.4615 (132) p=.000	.5267 (129) p=.000	.7826 (136) p=.000	.7242 (136) p=.000	.7467 (136) p=.000	.9299 (136) p=.000	1.0000 (136) p=.000					
Özdebir	.3451 (61) p=.003	.3333 (61) p=.004	.3312 (60) p=.005	.1203 (60) p=.180	.2085 (61) p=.053	.2634 (61) p=.020	.5049 (61) p=.000	.5509 (61) p=.000	.5207 (61) p=.000	.6428 (61) p=.000	.6166 (61) p=.000	1.0000 (61) p=.000				
ÖSS	.4409 (129) p=.000	.3865 (132) p=.000	.4813 (133) p=.000	.2789 (134) p=.001	.2996 (131) p=.000	.3257 (128) p=.000	.5971 (135) p=.000	.4970 (125) p=.000	.5103 (135) p=.000	.6987 (135) p=.000	.6622 (135) p=.000	.8758 (61) p=.000	1.0000 (135) p=.000			
ÖYS-Fen	.6051 (29) p=.000	.4678 (30) p=.005	.2768 (30) p=.069	.2881 (30) p=.061	.2217 (29) p=.124	.3299 (29) p=.040	.5259 (30) p=.001	.3795 (30) p=.019	.3644 (30) p=.024	.5598 (30) p=.001	.4873 (30) p=.003	.7789 (18) p=.000	.7555 (30) p=.000	1.0000 (30) p= 0		
ÖYS-Mat	.5638 (61) p=.000	.5342 (63) p=.000	.5898 (62) p=.000	.3563 (62) p=.002	.3197 (62) p=.006	.4766 (62) p=.000	.6045 (63) p=.000	.5950 (63) p=.000	.6072 (63) p=.000	.7392 (63) p=.000	.7293 (63) p=.000	.8447 (36) p=.000	.8878 (63) p=.000	.8534 (30) p=.000	1.0000 (63) p= 0	
ÖYS-TM	.2385 (53) p=.043	.2729 (53) p=.024	.3225 (54) p=009	.2987 (55) p=.013	.3596 (53) p=.004	.2471 (51) p=.040	.4560 (55) p=.000	.4180 (55) p=.001	.4348 (55) p=.000	.4858 (55) p=.000	.4441 (55) p=.000	.7451 (27) p=.000	.5879 (55) p=.000	.7084 (7) p=.035	.8322 (22) p=.000	1.0000 (25) p=.000

CHAPTER V

SUMMARY AND CONCLUSIONS

This chapter includes the summary of the problem, the methodology and the results of the study. The limitations and implications of this research are also presented in this section.

The Problem

The purpose of the study is two-fold. One is to test the combined effects of Mastery Learning Method of Instruction in addition to attendance to a Private University Preparatory Institution on measures related to the school achievement within the formal education system including the parallel forms of the pre-test scores on Mathematics, Physics and Chemistry, and summative test scores on these three subject areas. Another main concern of the study is again to test the combined effects of attendance to a Private University Preparatory Institution and Mastery Learning Method of Instruction on measures which are related to the achievement on the university entrance examination such as scores on the Mathematics and Science Tests similar to those given on the Student Placement Examination (OYS, 1986), scores on the test given by the Association of Private University Preparatory Institutions

(Özdebir, 1987), Student Selection Examination (ÖSS, 1987) and Student Placement Examination (ÖYS, 1987) scores.

Two instructional methods were used for four different groups of the 11th graders at the school setting in this researh. There was one group (section H) instructed under Mastery Learning Method of Instruction at school and attended the Private University Preparatory Institutions (ML+UPI), one group derived from 4 sections (sections C, F, J, K) all instructed under Mastery Learning Method of Instruction at school but not attending the Private University Preparatory Institution (ML), one group (section E) instructed under conventional method of Instruction at school but attending the Private University Preparatory Institution (UPI), and one control group derived from 5 sections (sections A, B, D, G, I) instructed under conventional method of instruction at school and did not attend any Private University Preparatory Institutions (control).

Methodology

The study was carried out at Fenerbahçe Lycée; a public co-educational high school in Istanbul, Turkey. There were 12 sections in the 11th grade level in this lycée; one was the Humanities (Edebiyat) section and the rest constituted the Science (Fen) sections of the 11th grade level. The Humanities section was not included in the study.

Thus all of the 11 science sections participated in the study. The total number of students in the 11 science sections was 495. However, only 136 students, 55 female and 81 male comprised the sample of the study. There were 41 students in the group under Mastery Learning Method of Instruction at school and attending the Private University Preparatory Institution (ML+UPI), 21 students in the group under Mastery Learning Method of Instruction at school but not attending any Private Preparatory Institution (ML), 43 students in the group under conventional method of instruction at school but attending the Private Preparatory Institution (UPI) and 31 students in the group under conventional method of instruction at school and not attending any Private Preparatory Institution (control group).

For one cell of the study which included students studying under Mastery Learning Method of Instruction but not attending the Private Preparatory Institutions, 4 classes (sections C, F, J, K) had to be collapsed to yield a sufficient number of students for this cell. In all of these 4 sections Mastery Learning Method of Instruction was implemented for the subject areas of Mathematics, Physics and Chemistry for all of the students. Out of these 4 sections, only 21 students were included in the study because these were the only students who did not attend any Private Preparatory Institution. Similarly, for a second cell; the control group, 5 sections (sections A, B, D, G, I)

had to be collapsed to yield 31 students who were not attending any Private Preparatory Institutions. For the other two cells; one section for each was used. Out of 495 students constituting the 11 science sections, only 12.53% did not go to any Private Preparatory Institutions whereas 87.47% of the total number of students attended a Private University Preparatory Institution. It is important to note here that approximately 70% of 11th graders in senior high schools attend these Institutions in Turkey. Out of 136 students which comprise the sample of the study, 38.2% did not attend any Private University Preparatory Institutions. 61.8% of the students in the actual sample participated in the Private University Preparatory Institutions.

There were 9 Mathematics, 5 Physics and 4 Chemistry totalling to 18 teachers instructing the 11th graders. However, it was possible to reduce the number of teachers that were going to participate in the study to 9. There were 4 Mathematics, 2 Physics and 3 Chemistry teachers who implemented the Mastery Learning Method of Instruction in their classes throughout the second semester.

The 9 teachers who participated in the study were instructed about Mastery Learning Method of Instruction by the researcher prior to study. The teachers were also provided by a copy of Yıldıran's Öğrenme Düzeyi ve Ürünleri (Level of Learning and Its Products) (1982) during the training period. The objectives for each learning task in

the subject areas of Mathematics, Phisics and Chemistry were developed by these 9 teachers with the help of the researcher within the training period. The other teachers were told that they were going to use their conventional methods throughout the second semester for the related subject areas.

There were 7 learning tasks in Mathematics, 5 learning tasks in Physics and 4 learning tasks in Chemistry totalling to 16 learning tasks for the second semester. The criterion level was set at 80% level of learning. Each learning task for the subject areas of Mathematics, Physics and Chemistry task approximately 3-10 class periods of instruction.

The study consisted of two parts. The first part was conducted during the last week of the 1st semester which consisted of the administration of a questionnaire developed by the researcher and her thesis advisor to determine the number of students who attended the Private Preparatory Institutions and who did not attend any Preparatory Institutions. Moreover, during the same week, 3 pre-tests in the subject areas of Mathematics, Physics and Chemistry, one in each, were administered to all of the 11 science sections which covered the first semester's curriculum in related subject areas. The purpose of these tests were to determine the inadequate areas of learning in the 1st semster's curriculum for the subject areas of Mathematics, Physics and

Chemistry. The second part of the study was conducted throughout the second semester until the final day of the school. The second part of the study included the review session which was held in the first week of the second semester, the administration of the parallel forms of the 3 pre-tests in the subject areas of Mathematics, Physics and Chemistry and the implementation of the Mastery Learning strategy in related subject areas. According to the results obtained on the pre-tests which were administered on the last week of the 1st semester, all of the students in the ML+UPI and ML groups were invited to participate in a review course for one week totalling to 12 hours for Mathematics, 9 hours for Physics and 8 hours for Chemistry. The purpose of the review session was to provide the students with remedial help on the inadequate areas of the 1st semester's curriculum on the 3 subject areas as well as to provide them with the necessary entry prerequisites for the 2nd semester's curriculum for the Mathematics, Physics and Chemistry. After this review session, all of the students in the four groups were given parallel forms of the pre-tests in the subject areas of Mathematics, Physics and Chemistry, one in each, to determine the effects of the correctives given in the review session. Two of the groups; namely, ML+UPI and ML were instructed under Mastery Learning Method of Instruction for the entire curriculum of the 2nd semester on Mathematics, Physics and Chemistry. On the other hand, the other two groups; UPI and control were taught under

traditional methods of instruction. After the completion of each learning task for every subject area, formative tests were administered to all of the four groups. However, the parallel forms of the formative tests, feedback and correctives were given only to students in the ML+UPI and ML groups who could not reach the 80% criterion level of learning. The students in the UPI and control groups received neither feedback / correctives nor the parallel forms of the formative tests throughout the second semester.

At the completion of all the learning tasks, 3 summative tests on the subject areas of Mathematics, Physics and Chemistry were given to all of the students in the four groups. Moreover, a Mathematics and a Science Test similar to those given on the Student Placement Examination (ÖYS, 1986) were administered to all of the students under four treatment groups. In addition to this, the students in the sample had also taken the test given by the Association of Private University Preparatory Institutions (Özdebir, 1987), the first stage of the university entrance examination (ÖSS, 1987) as well as the second stage, namely the Student Placement Examination (ÖYS, 1987).

The pre-tests and their parallels on the subject areas of Mathematics, Physics and Chemistry were developed by the course teachers of Fenerbahçe Lycée with the help of the researcher before they were told about the intervention they would be responsible for. On the other hand for the

subjects of Mathematics and Physics, all of the formative tests, their parallels, summative tests as well as the Mathematics and Science Tests similar to those given on the Student Placement Examination (ÖYS, 1986) were prepared by two engineers from the İstanbul Technical University who were senior students and were working as tutors at the time the study was carried out. For the subject area of Chemistry, the tests were developed by a chemistry teacher who was teaching the 11th grade level at a different public high school in Istanbul.

Hypotheses and Results

In this study, the main concern is to investigate the combined effects of Mastery Learning Method of Instruction and attendance to a Private University Preparatory Institution on measures related to the school curriculum such as the parallel forms of the pre-tests on Mathematics, Physics and Chemistry and summative test scores on these 3 subject areas as well as measures which are in relation to university entrance examination including scores on a Mathematics, and a Science Test similar to those given on the Student Placement Examination (ÖYS, 1986), scores on the test given by the Association of Private University Preparatory Institutions (Özdebir, 1987), Student Selection Examination (ÖSS, 1987) and Student Placement Examination (ÖYS, 1987) scores.

Several statistical techniques were used to test the nine hypotheses of the study. These techniques include One-way Analysis of variance, Two-way Analysis of variance, Newman-Keuls statistics, t-test analyses, E correlational ratios and effect size analyses.

There were nine hypotheses in this study. The first hypothesis of the study was:

HYPOTHESIS 1: THE SCORES OF THE STUDENTS IN THE FOUR GROUPS (ML+UPI, UPI, ML, C) WILL NOT SIGNIFICANTLY DIFFER FROM ONE ANOTHER ON THE MATHEMATICS, PHYSICS AND CHEMISTRY PRE-TESTS.

The first hypothesis of the study was tested first by using one-way analysis of variance to check if there were any significant differences among the four groups on the 1st semester's curriculum for Mathematics measured by the Pre-test. The results of the analysis showed that there were significant differences among the four groups at the .05 level of significance for the Mathematics Pre-test. The results of the Newman-Keuls and t-tests also demonstrated that the four groups differed from each other in terms of the 1st semester's curriculum on Mathematics. According to the Newman Keuls statistic, there was a significant difference at the .05 level of significance when ML+UPI and ML groups were compared favoring the ML+UPI group. Similarly, when UPI and ML groups were compared, the same significance level was also observed favoring the UPI group. T-tests were also used to compare the four groups with one

another. When ML+UPI and ML groups were compared, the difference was significant at the .05 significance level. Moreover, when the students in the UPI and ML groups were compared, the difference was significant at the .01 level. Finally, there was a significant difference at the .05 level of significance when UPI and control groups were compared. As the findings suggest the groups differed from one another in terms of the 1st semester's curriculum on Mathematics measured by the Pre-test, the ML group and the control group scoring significantly lower than the ML+UPI and UPI groups; the other groups not differing significantly from one another.

The same analysees were also used for the Physics Pre-test. According to the results of the One-way analysis of variance, the four groups significantly differed from one another at the .00001 level of significance showing that the groups were markedly different from each other. The results of Newman Keuls also showed that the significant differences between the groups ML+UPI and ML, ML+UPI and Control, UPI and ML and UPI and control were at the .01 level of significance for all of the comparisons. The findings of the t-tests were in the same direction as the findings of Newman-Keuls formula. The significant differences between ML+UPI and ML, ML+UPI and control, UPI and ML and UPI and control were at the .001, .0001, .01 and .0001 levels of significance, respectively. As the findings suggest, ML+UPI and UPI groups were similar to each other while they both

differed significantly from the ML and control groups, the latter two also being similar to one another in terms of the Physics Pre-test.

The analyses that were carried out for Mathematics and Physics Pre-tests were also utilized for the Chemistry Pre-test. The results of one-way analysis of variance test showed that the four groups were significantly different from one another at the .0001 level of significance. When Newman-Keuls formula was used for comparing the four groups with each other, there were significant differences between ML+UPI and ML, ML+UPI and UPI and ML+UPI and control at the .05, .01 and .01 levels of significance, respectively. The results of t-test analyses also demonstrated that the significant differences between ML+UPI and ML, ML+UPI and UPI and ML+UPI and control were at the .001, and .0001 levels respectively. In short, the group under both treatments scored significantly higher than any of the other groups followed by UPI and ML groups respectively in terms of the 1st semester's curriculum for Chemistry measured by the Pre-test. It should be noted that the mean performance of ML+UPI and UPI groups resemble one another. Similarly, ML and control groups are also like one another.

As the results of the analyses done to test the first hypothesis showed, there were significant differences among the four groups in terms of the first semester's curriculum on Mathematics, Physics and Chemistry measured by

the Pre-tests in these 3 subject areas. In the light of the evidences stated above, the first hypothesis of the study is rejected.

The second hypothesis of the study can be stated as:

HYPOTHESIS 2: THERE WILL BE A SIGNIFICANT EFFECT OF MASTERY LEARNING METHOD OF INSTRUCTION AND PRIVATE UNIVERSITY PREPARATORY INSTITUTION ATTENDANCE ON THE PARALLEL FORMS OF THE PRE-TESTS ON MATHEMATICS, PHYSICS AND CHEMISTRY.

The second hypothesis of the study was first tested by the use of two-way analysis of variance. According to the two-way analysis of variance test done on the parallel form of the Mathematics Pre-test, Mastery Learning Method of Instruction affected achievement at the .0001 level of significance whereas Private University Preparatory Institution attendance had an effect on achievement at the .02 level of significance. Both of the interventions had a great effect on the achievement level in terms of the parallel form of the Mathematics Pre-test, the effect of Mastery Learning being much more sizeable. The results of Newman-Keuls demonstrated that the significant differences between the groups ML+UPI and control, ML and control, UPI and control, ML+UPI and UPI and ML and UPI were at the .01, .01, .05, .01 and .01 levels, respectively. The results of t-tests were in accordance with the results of Newman Keuls formula. The significant differences between ML+UPI and

control, ML and control, UPI and control, ML+UPI and UPI and ML and UPI were at the .0001, .0001, .05, .0001 and .01 levels, respectively. ML+UPI, ML and UPI groups scored significantly higher than the control group on the Parallel form of the Mathematics Pre-test. In addition to these analyses, E correlation ratios which give the amount of variance accounted for by each intervention were computed based on the two way analysis of variance. Mastery Learning alone accounted for 23% of the variation in achievement and attending Private University Preparatory Institutions accounted approximately 3% of the variance in achievement on the parallel form of the Mathematics Pre-test. These two variables, together, accounted for approximately 26% of the variance in achievement.

The effect size analyses showed a difference of about 2 standard deviations when the group which was instructed under Mastery Learning Method of Instruction and attending the Private University Preparatory Institution was compared to the control group. The same analysis showed a difference of 1.648 standard deviation when the Mastery Learning group was compared to the control group. When the group attending the Private Preparatory Institution was compared to the control group, a difference of .66, more than half a standard deviation was found. when the group instructed under Mastery Learning Method of Instruction and attending the Private Preparatory Institution and the group attending the Private University Preparatory Institution

were compared, a difference of 1.115 standard deviation was computed. Finally, when the same analysis was utilized for comparing the Mastery Learning and Private University Preparatory Institution groups, a difference of .835, almost a standard deviation was found.

The same analyses were also carried out for the Parallel form of the Physics Pre-test. First of all, according to the results of the two way analysis of variance, Mastery Learning Method of Instruction affected achievement at the .0001 level of significance. Similarly, attending the Private University Preparatory Institution had an impact on the achievement at the .0001 level of significance. As it can be seen, the effect of both of the interventions were highly significant on the parallel form of the Physics Pre-test. When Newman-Keuls statistics was used, the results showed that the significant differences between the groups ML+UPI and control, ML and control, UPI and control, ML+UPI and UPI, ML and UPI and ML+UPI and ML were at the .01, .01, .01, .01, .05, and .05 levels, respectively. When t-tests were utilized for further investigating the findings of the Newman-Keuls statistics, the results were similar to the results of Newman-Keuls statistics. The group under both interventions scored significantly higher than all of the other groups, followed the ML and the UPI groups respectively. E correlation ratios were the next analyses which were carried out for the Parallel Form of the Physics Pre-test. Mastery Learning

Method of Instruction accounted for approximately 31% of the variation in achievement while attending the Private Preparatory Institution accounted for approximately 13% of the variance in achievement. Together, the two interventions accounted for about 44% of the variation in achievement on the parallel form of the Physics Pre-test.

The effect size analyses showed a difference of 2.27 standard deviations when ML+UPI and control groups were compared. A difference of 1.716 standard deviation was computed when ML and control groups were compared. When UPI group was compared to the control group, a difference of 1.14 standard deviation was found. When ML+UPI and UPI groups were compared, a difference of 1.267 standard deviation was calculated. When ML group was compared to the UPI group, a difference of .64, more than half a standard deviation was found. Lastly, when ML+UPI and ML groups were compared, half a standard deviation was also found between these two groups.

In short, the group which was under both treatments scored significantly higher than all of the other groups. This group was followed by the group under Mastery Learning Method of Instruction and the group attending the Private University Preparatory Institution, respectively.

For the parallel from of the Chemistry Pre-test, first of all, the two way analysis of variance was utilized. The results of the two way ANOVA showed that Mastery

Learning Method of Instruction affected achievement at the .0001 level of significance while attending the Private University Preparatory Institution did not have an impact on achievement. Mastery Learning had a sizeable effect on the Parallel Form of the Chemistry Pre-test. When Newman-Keuls statistics was used for comparison purposes, the significant differences between ML+UPI and control, ML and control, ML+UPI and UPI and ML and UPI were at the same level, namely .01 level of significance. The findings of t-test analyses were in agreement with the findings obtained from the Newman-Keuls formula. The significant differences between ML+UPI and control, ML and control ML+UPI and UPI and ML and UPI were at the .0001, .001, .0001 and .05 levels of significance, respectively.

When E correlation ratios were calculated according to the results of the two-way analysis of variance, Mastery Learning Method of Instruction accounted for 21% of the variance in achievement. On the other hand, Private University Preparatory Institution attendance accounted for about 2% of the variation in achievement. The two treatments together accounted for 23% of the variance in achievement on the parallel form of the Chemistry Pre-test.

The effect size analyses done demonstrated a difference of 1.44 standard deviation when ML+UPI and control groups were compared. The same analysis showed a difference 1.13 when ML and control groups were compared. A

difference of .90, almost a standard deviation was found when ML+UPI and ML groups were compared. Lastly, when ML and UPI groups were compared, a difference of .67, more than half a standard deviation was calculated between these two groups.

In the light of the evidences that are stated above, the second hypothesis of the study is clearly confirmed.

The third hypothesis of the study was stated as:

HYPOTHESIS 3: THERE WILL BE A SIGNIFICANT EFFECT OF MASTERY LEARNING METHOD OF INSTRUCTION AND PRIVATE UNIVERSITY PREPARATORY INSTITUTION ATTENDANCE ON THE MATHEMATICS, PHYSICS AND CHEMISTRY SUMMATIVE TESTS.

The same analyses were used to test the third hypothesis of the study. According to the results of two-way ANOVA test done for the Mathematics Summative Test, Mastery Learning Method of Instruction affected achievement at the .01 level of significance, whereas attending the Private University Preparatory Institution affected achievement at the .02 level. When Newman-Keuls was carried out, there were some significant differences among the groups that were under consideration in this study. When ML+UPI and control groups were compared, a significant difference was found at the .01 level. The difference was significant at the .05 level, when ML and control groups were compared. When the UPI and control groups were compared, the difference was

again significant at the same significance level. As the results of the t-test showed, the group under both treatments and ML group scored significantly higher than the UPI and control groups.

According to the results of the E correlation ratios, Mastery Learning Method of Instruction accounted for 4.4% of the variance in achievement on the Mathematics Summative test. Similarly, Private Preparatory Institution attendance accounted for 4% of the variance in achievement. 8% of the variation in achievement on the Mathematics Test was accounted for by both of the independent variables.

When the effect size analyses were calculated, a difference of 1.19 was found between ML+UPI and control groups. When ML and control groups were compared, a difference of .94, almost a standard deviation was calculated between these two groups. A difference of .81 was computed when UPI and control groups were compared.

When the same analyses were utilized for the Physics Summative test, the findings were as follows. First of all, according to the results of two-way analysis of variance, Mastery Learning Method of Instruction had an impact on achievement at the .036 level of significance while attending the Private University Preparatory Institution did not have a significant effect on the achievement. When Newman-Keuls formula was used, no two groups were significantly different from each other on this

test. However, according to the t-test analyses, some significant differences were found among some groups. When ML+UPI and control groups were compared, the was a significant difference at the .05 level. Similarly, when ML and control groups were compared, there was again a significant difference at the same significance level. The mean performances of the ML+UPI and ML groups were similar on the Physics Summative test followed by UPI and control groups respectively. The reason for the difference between the results of Newman Keuls formula and t-tests might be attributed to Newman Keuls being a more rigorous statistics than the t-tests.

When E correlation ratios were calculated, it was found that Mastery Learning alone accounted for 3% of the variation in achievement on the Physics Summative test while Private University Preparatory Institution attendance did not explain much about the variance. About 4% of the variance in achievement can be accounted for by both of the interventions.

Finally according to the results of the effect size analyses, a difference of .689 more than half a standard deviation, was found when ML+UPI and control groups were compared. When ML and control groups were compared a difference of .64, again more than half a standard deviation was found between these two groups.

As far as the Chemistry Summative test was concerned, first, a two-way analysis of variance was utilized where Mastery Learning Methof of Instruction affected achievement at the .05 level. Likewise, Private University Preparatory Institution attendance had an effect on achievement at the .047 level of significance. When the Newman-Keuls statistics was carried out, a significant difference was found among the ML+UPI and control groups at the .05 level. When ML and control groups were compared, the difference was approaching significance at the .05. Similarly, there was an approaching significance at the .05 level, when UPI and control groups were compared. The findings of the t-test analyses were in accordance with the findings of the Newman-Keuls formula. The ML+UPI and ML group score significantly higher than the UPI and Control groups.

According to the results of the E correlation ratios, Mastery Learning Method of Instruction alone accounted for about 3% of the variance in achievement. Another 3% of the variance was accounted for by attending the Private University Preparatory Institutions. About 6% of the variation in achievement on the Chemistry summative test was accounted for by both the treatments.

The effect size analyses showed a difference of .96 almost a standard deviation when ML+UPI and control groups were compared. When ML group was compared to the

control group, a difference of .68, more than half a standard deviation was found. Lastly, a difference of .64, again more than half a standard deviation was found between UPI and control groups.

The usual pattern which showed itself on all of the analyses in relation to the third hypothesis of the study was that ML+UPI and ML groups scored significantly different from the UPI and control groups. Thus, the third hypothesis of the study was strongly confirmed.

The fourt hypothesis of the study can be stated as;

HYPOTHESIS 4: THERE WILL BE A SIGNIFICANT EFFECT OF PRIVATE PREPARATORY INSTITUTION ATTENDANCE AND MASTERY LEARNING METHOD OF INSTRUCTION ON THE MATHEMATICS AND SCIENCE TEST SIMILAR TO THOSE GIVEN ON THE STUDENT PLACEMENT EXAMINATION (ÖYS, 1986).

In order to test this analysis of variance test was used for the Mathematis Test similar to those given on the Student Placement Examination (ÖYS, 1986). The findings illustrated that attending the Private University Preparatory Institution had an impact on achievement at the .001 level of significance while Mastery Learning does not affect achievement significantly. As Newman Keuls showed, when ML+UPI and control groups were compared, there was a significant difference at the .05 level. Similarly, there was again a significant difference at the .05 level of

significance when UPI group was compared to the control group. A significant difference was found at the same significance level between ML+UPI and ML groups, favoring the ML+UPI group. T-tests were also used to compare ML+UPI and control groups. There was a significant difference at the .001 level, favoring the ML+UPI group. When UPI and control groups were compared, the difference was significant at the .01 level. A difference which was significant at the .05 level of significance was found when ML+UPI group was compared to the ML group. The important thing to note here is that the mean performances of the ML+UPI and UPI groups resembled one another while the other two, namely ML and control groups were similar. Both ML+UPI and UPI groups scored significantly higher than the ML and control groups on the Mathematics Test similar to the one given on the Student Placement Examination (BYS, 1986). Based on the results of two-way ANOVA test, E correlation ratios showed that Private University Preparatory Institution attendance alone accounted for about 9% of the variation in achievement but the other intervention did not account for the variation on this test.

The effect size analysis done between ML+UPI and control groups revealed a difference of .93, almost a standard deviation between these two groups, favoring the ML+UPI group. The effect size analysis done showed a difference of .81 between UPI and control groups, favoring the UPI group. When on effect size analysis was calculated

between ML+UPI and ML groups, a difference of .64, more than half a standard deviation was found between these two groups. Finally a difference of .53, half a standard deviation was found when UPI and ML groups were compared, favoring the UPI group.

The same analyses were also carried out for the Science Test similar to the one given on the Student Placement Examination (OYS, 1986). According to the results of two-way analysis of variance, Private University Preparatory Institution attendance affected achievement at the .0001 level of significance whereas Mastery Learning didnot affect achievement on the Science Test similar to the one given on the Student Placement Examination (OYS, 1986). When Newman Keuls was utilized to evaluate the difference between ML+UPI and control groups, the difference was significant at the .05 level. A difference approaching significance was found at the same level, when UPI and control groups were compared. When ML+UPI group was compared to the ML group, again a significant difference was revealed at the .05 level. Finally, when UPI and ML groups were compared, the difference was significant at again the same significance level. According to the T-test results, the significant differences between ML+UPI and control , UPI control, ML+UPI and ML and UPI and ML were at the .001, .05, .001 and .05 levels, respectively. The group instructed under Mastery Learning Method of Instruction and attending the Private University Preparatory Institution and the group

attending the Private University Preparatory Institution scored significantly higher than the Mastery Learning and control groups, ML+UPI and UPI being similar to one another.

When E correlation ratios were calculated, attending the Private Preparatory Institution alone accounted for about 9% of the variance in achievement on the Science Test similar to the one given on the Student Placement Examination (OYS, 1986), while Mastery Learning Method of Instruction did not account for the variation in achievement.

The effect size analysis of ML+UPI and control groups revealed a difference of .98, almost a standard deviation, favoring the ML+UPI group. The effect size analysis done between UPI and control groups showed a difference of .51, half a standard deviation between these two groups, favoring the UPI group. The effect size analysis demonstrated a difference of .84 between ML+UPI and ML groups. Finally, a difference of .63, more than half a standard deviation was found when UPI and ML groups were compared.

According to the results obtained from the analyses done in relation to this hypothesis, ML+UPI and UPI groups scored significantly higher than the ML and control groups on the Mathematics and Science Tests similar to the ones given on the Student Placement Examination (OYS, 1986).

Thus, in the light of the evidence stated above, the fourth hypothesis of the study was partially supported.

The fifth hypothesis of the study can be stated as;

HYPOTHESIS 5: THERE WILL BE A SIGNIFICANT EFFECT OF PRIVATE UNIVERSITY PREPARATORY INSTITUTION ATTENDANCE AND MASTERY LEARNING METHOD OF INSTRUCTION ON THE TEST GIVEN BY THE ASSOCIATION OF PRIVATE UNIVERSITY PREPARATORY INSTITUTIONS (Ozdebir, 1987).

When a two-way analysis test was done in relation to this test, attending the Private University Preparatory Institution had an impact on achievement at the .03 level of significance, the impact of Mastery Learning being not significant.

When Newman-Keuls statistic was used, no two groups were significantly different from one another. However, when t-test analyses were utilized, there was a significant difference at the .05 level when ML+UPI and control groups were compared. Similarly, when UPI and control groups were compared, a significant difference at the .05 level was found. The UPI group scored significantly higher than the control group followed by the ML+UPI group.

According to the E correlation ratios, the amount of variance accounted for by attending the Private University Preparatory Institution was about 8%, while Mastery Learning does account much (.03%).

When effect size analysis were done between ML+UPI and control groups, a difference of 1.39 standard deviation was found favoring the ML+UPI group. The same analysis showed a difference of about 1.70 standard deviation between UPI and control groups. When ML+UPI and ML groups were compared, a difference of .675, more than half a standard deviation was found between these two groups. A difference of .89 was revealed when UPI and ML groups are compared. Finally, when ML group was compared to the control group, a difference of .44 was calculated.

The results of this hypothesis showed that the fifth hypothesis of the study was partially supported.

The sixth hypothesis of the study can be stated as:

HYPOTHESIS 6: THERE WILL BE A SIGNIFICANT EFFECT OF PRIVATE PREPARATORY INSTITUTION ATTENDANCE AND MASTERY LEARNING METHOD OF INSTRUCTION ON THE STUDENT SELECTION EXAMINATION (OSS, 1987).

The findings of two-way analysis of variance showed that attending the Private University Preparatory Institution had an effect achievement at the .0001 level whereas the effect of Mastery Learning being not significant on the Student Selection Examination (OSS, 1987). The results of Newman Keuls on the other hand, showed that the significant differences between the groups ML+UPI and control, UPI and control, ML+UPI and ML, and UPI and ML were

at the .01 level of significance for four of the comparisons. Furthermore, when t-test analyses were utilized, the ML+UPI and UPI groups scored significantly higher than the ML and control groups, the former two being similar to each other. Attending the Private University Preparatory Institution accounted for about 17% of the variance in achievement while Mastery Learning did not account much (.2%). Effect size analyses showed a difference of .96, almost a standard deviation between ML+UPI and control groups, favoring the ML+UPI group. Similarly, a difference of 1.11 was found when UPI group and control group were compared. When ML+UPI and ML groups were compared, a difference of 1.3 standard deviation was found. Finally, a difference of 1.48 standard deviations was revealed when UPI and ML groups were compared, favoring the UPI group.

As the findings suggested, Private University Preparatory Institution attendance affected achievement on the Student Selection Examination (SSS, 1987) sizeably. ML+UPI and UPI groups scored significantly higher than the ML and control groups. Thus, the sixth hypothesis of the study was partially supported according to the findings.

The seventh hypothesis of the study can be stated as:

HYPOTHESIS 7: THERE WILL BE A SIGNIFICANT EFFECT OF PRIVATE UNIVERSITY PREPARATORY INSTITUTION ATTENDANCE AND MASTERY LEARNING METHOD OF INSTRUCTION ON THE SCIENCE SCORES OF THE STUDENT PLACEMENT EXAMINATION (ÖYS-FEN 1987).

According to the results of the two-way analysis of variance, attending Private University Preparatory Institution affected achievement of the .0001 level of significance whereas Mastery Learning Method of Instruction did not have a significant impact on the science scores of the Student Placement Examination (ÖYS-Fen, 1987). When the groups were compared using the Newman-Keuls statistics, a significant difference was found between ML+UPI and control groups at the .01 level. Similarly, the comparison between UPI and control groups showed a significant difference at the same significance level, namely .01 level of significance. Moreover, when t-test analyses were carried out UPI group scored significantly higher than the control group, followed by ML+UPI group. It should be noted that none of the students in the Mastery Learning group took the science test on the Student Placement Examination (ÖYS, 1987).

Attending the Private University Preparatory Institution accounted for about 47% of the variance in achievement on the science scores of the Student Placement

Examination (ÖYS-Fen, 1987) while Mastery Learning Method of Instruction did not explain much. Effect size analyses revealed a difference of 1.06 standard deviation between ML+UPI and control groups, favoring the ML+UPI group. With the same analyses, when UPI and control groups were compared, a diference of 1.18 was found.

According to the results of the analyses that were carried out for the seventh hypothesis of the study, attending the Private University Preparatory Institution had a great effect on the science Scores of the Student Placement Examination (ÖYS-Fen, 1987) while Mastery Learning Method of Instruction did not affect the achievement.

Thus, in the light of the evidences stated above, the seventh hypothesis of the research was partially supported.

The eighth hypothesis of the study can be stated as:

HYPOTHESIS 8: THERE WILL BE A SIGNIFICANT EFFECT OF PRIVATE UNIVERSITY PREPARATORY INSTITUTION ATTENDANCE AND MASTERY LEARNING METHOD OF INSTRUCTION ON THE MATHEMATICS SCORES OF THE STUDENT PLACEMENT EXAMINATION (ÖYS-MAT, 1987).

As the results of two-way analysis of variance revealed, attending the Private University Preparatory Institution had an impact on achievement at the .0001 level of significance. On the other hand, Mastery Learning Method

of Instruction did not affect achievement on the Mathematics Scores of the Student Placement Examination (OYS-Mat, 1987) significantly.

When Newman Keuls statistics was utilized for comparing the groups, significant differences among ML+UPI and control, UPI and control, ML+UPI and ML and UPI and ML were at the .05 level of significance for all of the comparisons. However, when UPI and control groups were compared, the difference was approaching significance at this significance level. The results of t-test analyses were in accordance with the results obtained from the Newman-Keuls formula. ML+UPI and UPI groups scores significantly higher than the ML and control groups on the Mathematics Scores of the Student Placement Examination (OYS-Mat, 1987), the former two being similer to one another in terms of the mean performances, the mean performance of UPI group being higher than ML+UPI group.

When E correlation ratios were computed, attending the Private University Preparatory Institution accounted for 19% of the variance in achievement while Mastery Learning strategy didnot account much significantly.

When ML+UPI group was compared to the control group, a difference of 1.27 standard deviations was revealed between these two groups. A difference of 1.40 standard deviations was calculated when UPI and control groups were compared. Similarly, effect size analyses showed a

difference of 3.10 standard deviations between ML+UPI and ML groups. The same analyses showed a difference of 3.33 standard deviations when UPI group was compared to the ML group.

In the light of the evidences mentioned above, the eighth hypothesis of the study is partially supported.

The ninth hypothesis of the study can be stated as:

HYPOTHESIS 9: THERE WILL BE A SIGNIFICANT EFFECT OF PRIVATE UNIVERSITY PREPARATORY INSTITUTION ATTENDANCE AND MASTERY LEARNING METHOD OF INSTRUCTION ON THE COMBINED TURKISH AND MATHEMATICS SCORES OF THE STUDENT PLACEMENT EXAMINATION (ÖYS-TM, 1987).

The results of two-way ANOVA illustrated that attending the Private University Preparatory Institution affected achievement on the combined Turkish and Mathematics scores of the Student Placement Examination (ÖYS-TM, 1987), at the .01 level of significance. When Newman Keuls statistics was used for comparing the groups, there was a significant difference at the .05 level when ML+UPI and control groups were compared. The difference was again significant at the same significance level when UPI group was compared to the control group. The results obtained from t-test analyses were similar to the results obtained from the Newman-Keuls formula. ML+UPI group scored significantly

higher than the control group, followed by the UPI group and the ML group respectively.

Private University Preparatory Institution attendance accounted for about 11% of the variation in achievement, whereas Mastery Learning alone accounted for only 1% of the variance in achievement on the combined Turkish and Mathematics scores of the Student Placement Examination (OYS-TM, 1987). Together, the two treatments accounted for about 12% of the variance in achievement.

Effect size analyses done between ML+UPI and control groups showed a difference of .61, more than half standard deviation between these two groups. When the same analysis was done for UPI and control groups, again more than half a standard deviation was computed. A difference of .66 was found between ML+UPI and ML groups. Finally, when UPI and ML groups were compared, a difference of .63 was revealed between these two groups.

As the results demonstrated, Private University Preparatory Institution attendance affected achievement significantly on the Combined Turkish and Mathematics scores of the Student Placement Examination (OYS-TM, 1987), whereas Mastery Learning Method of Instruction did not affect achievement significantly.

Thus, according to the findings of the study, the ninth hypothesis was also partially supported.

Limitations of the Study and Suggestions for Further Research

The study was carried out at a public high school in İstanbul. The medium of instruction was Turkish. The reason for choosing this school was that this school was a public school where the students were not selected on the basis of their entry characteristics or cognitive abilities. On the university entrance exam scores, this lycée was around the median among İstanbul schools and ranked 149th among all of the 1346 senior high schools in Turkey on the first stage of the examination, namely, the Student Selection Examination (ÖSS, 1987). On the other hand, the achievement rank of this lycée was determined as 158 in terms of the weighted science scores, as 255 in terms of the weighted mathematics scores, and as 319 in terms of the combined weighted Turkish/Mathematics scores among 1346 high schools on the Student Placement Examination (ÖYS, 1987) for the academic year of 1986-1987.

Furthermore, since this lycée was a public school where the students came mainly from middle-class families (not upper-middle class), it was possible to find some students at the 11th grade level who did not attend any Private University Preparatory Institutions. Out of 495 students which constituted the 11 science sections of Fenerbahçe Lycée, 87.47% of the total number of students attended a Private University Preparatory Institution

whereas only 12.53% did not participate in any Private University Preparatory Institutions.

All of the 11 science sections participated in the study in order to assign a sufficient number of students in the four groups that were under consideration for this research. For the ML+UPI and UPI groups, one section for each was used. However, for one group which included students studying under Mastery Learning Method of Instruction but not attending the Private University Preparatory Institution, 4 sections (sections C, F, J, K) had to be collapsed to produce a sufficient number of students for this group. It should be mentioned that for this group, all of the students in the four classes were instructed under Mastery Learning Method of Instruction for the subject areas of Mathematics, Physics and Chemistry. Similarly, for a second group; the control, 5 sections (sections A, B, D, G, I) had to be collapsed to yield a sufficient number of students.

There were 9 Mathematics, 5 Physics and 4 Chemistry totalling to 18 teachers instructing the 11th graders at Fenerbahçe Lycée. Though it was possible to reduce the number of teachers that were going to participate in the study to 9, it was very hard to arrange a convenient schedule for all of the teachers for training. Therefore, the researcher had meetings with the teachers in small

groups according to their subject area, and the most important of all, according to their free hours.

The most important limitation of the study was that Mastery Learning Method of Instruction was only implemented for 3.5 months, whereas the duration of attendance to a Private University Preparatory Institution had a mean of 7.33 months of attendance (a full academic year) with a standard deviation of 2.1 months. It should be noted that Mastery Learning was implemented for only one semester, namely for the second semester of 1986-87 academic year. On the other hand, questions on the Student Selection and Placement Examination (OSYS) seem to include all of the curricula for the 9th, 10th and 11th grade levels. Therefore, the implementation of Mastery Learning strategy for only the second semester of the 11th grade curriculum was not sufficient to affect the achievement levels of students on the Student Selection and Placement Examination significantly. It is suggested for further research that if Mastery Learning Method of Instruction is implemented for at least 2 semesters, in other words for all of the 11th grade curriculum, it would increase the achievement levels of students even further. The implementation of the Mastery Learning strategy throughout the entire curricula would provide more satisfactory results in terms of the achievement levels of students on the Student Selection and Placement Examination (OSYS).

Another major limitation of the study was the time spent for providing the students with the necessary prerequisites for the 2nd semester's curriculum as well as giving therm remedial help for the inadequate areas of 1st semester's curriculum. Although the students in the ML+UPI and ML groups were invited for this review session during the semester brake, most of them did not want to come to school. Therefore, the review course had to be cancealled and it took place on the 1st week of the 2nd semester totalling to only 12 hours for Mathematics, 9 hours for Physics and 8 hours for Chemistry. It is suggested for further research that there should be more time spent on this review course in order to provide students with the necessary prerequisitee as well as to furnish the deficiences of the previous semester's curriculum.

Another limitation of the study was that there were significant differences among the four groups in the study in relation to the first semester's curriculum on the subject areas of Mathematics, Physics and Chemistry before Mastery Learning Method of Instruction was implemented.

In other words, the four groups that were under consideration in this research were not similar to one another measured by the 3 pre-tests in the subject areas of Mathematics, Physics and Chemistry at the end of the 1st semester. The usual pattern on the 3 Pre-tests was such that ML+UPI and UPI groups were similar to each other while they

both differed significantly from the ML and control groups, the latter two scoring significantly lower and also being similar to each other. It should be noted that students in the ML group scored the lowest of all the groups both on the Mathematics and Physics Pre-tests. However, it is noteworthy that the ML group which scored the lowest on the 3 Pre-tests scored significantly higher than UPI and control groups on the parallel forms of the Pre-tests given after remedial help as well as on the summative examinations. If help given for not more than 12 hours produces very high achievement levels for a group that scored the lowest on the pre-tests, it is expected that the effects of Mastery Learning would be highly significant at least on the achievement scores of students.

One final limitation of the study is the question raised by the findings. Mastery Learning which significantly affects school achievement does not seem to affect university entrance exam scores. Could this be the result of the content validity of the questions on the university entrance exams such that the questions do not sample the curriculum taught in Turkish lycées. The fact that the tests correlate highly with one another may not indicate content validity; these correlations may only indicate that students scoring high on one type of an exam (achievement tests) also score highly on the university entrance exams. The fact that none of the ML students took the science placement test is also noteworthy.

Conclusions and Implications

The major issue that came up throughout the study was the degree of correspondence between the skills taught in high schools and the content of Student Selection and Placement Examination (OSYS). Mastery Learning group which scored the lowest of all groups on the Pre-tests achieved significantly higher than the students attending the Private University Preparatory Institutions on the average for a full academic year on the parallel forms of the Pre-tests as well as on the summative test measures with the help given for not more than 12 hours. On the other hand, Mastery Learning did not seem to affect university entrance exam scores. Could this be the result of the representation of only 1/6 of the curriculum on the university entrance exam and implementation of Mastery Learning strategy for only the second semester of 11th grade level or are the questions on Student Selection and Placement Examination (OSYS) such that they do not cover the curriculum taught in Turkish high schools?

Another noteworthy point to be made on this study is that none of the students in the Mastery Learning group took the science test on the Student Placement Examination (OYS). Students attending the Private University Preparatory Institutions score high on the university entrance exam because these institutions teach students the skills and techniques required by the university entrance exams. Thus,

Students' prior knowledge of this fact might cause them not to take this test for they do not attend any Preparatory Institutions and they already presume that they will not be succesful on the science placement test.

A final point is Private University Preparatory Institutions being outside the formal educational system and being "private" are not desirable on time and cost bases even though they teach students the necessary skills and test techniques required by the entrance examinations. A better solution for all of the education system could be the implementation of a more general strategy into the high school. Since Mastery Learning, both as a theory and a method could easily be implemented into the formal educational system, it would be more desirable using Mastery Learning as a teaching and learning method. By including the skills that are required by the Student Selection and Placement Examination (OSYS) and by implementing it for the entire high school curriculum, Mastery Learning Method of Instruction would produce sizeable effects in relation to both school achievement and university entrance exams.

The educational policies of Turkey should consider these points seriously.

APPENDIX A

This section includes the learning units and the objectives for each learning task for the subject areas of Mathematics, Physics and Chemistry, respectively. This section also includes the Pre-tests in the related subject areas as well as their parallels. The formative tests, their parallels and the summative tests in these three subject areas are also presented in this section. Moreover, the Mathematics and Science Tests similar to those given on the Student Placement Examination (OYS, 1986) are given in this section.

LİSE ÖĞRENCİLERİNİN ÜNİVERSİTE HAZIRLIK KURSLARINA DEVAMLARINI SAPTAMAYA YÖNELİK ANKET

Güzver Yıldıran

Elif Çetin

Bu anketin amacı, Boğaziçi Üniversitesi Eğitim Bilimleri Bölümü Rehberlik ve Psikolojik Danışma Lisansüstü programının bir parçası olan ve Doç.Dr.Güzver Yıldıran'ın danışmanlığında yürütülen "Tam Öğrenme Yöntemi ve Üniversite Hazırlık Kurslarına Devamın Fen Dersleri Başarısı ve Üniversite Giriş Sınavları Üzerindeki Etkileri" adlı tez çalışmasında örneklem olarak düşünülen siz lise son sınıf öğrencilerinin özellikleri hakkında bilgi toplamaktır.

Aşağıda bulunan sorulardaki boşlukları durumunuza uygun şekilde doldurunuz. Seçenekli soruları ise size en uygun seçeneği daire içine alarak cevaplayınız.

1. Soyadınız : .....
   Adınız : .....

2. Cinsiyetiniz :
   (a) kız (b) erkek

3. Doğum Tarihiniz : .....

4. Annenizin en son bitirdiği öğrenim kurumu :

   (a) ilkokul

   (b) orta okul

   (c) lise

   (d) meslek okulu

   (e) üniversite/yüksek okul

   (f) hiç gitmemiş

5. Annenizin mesleği : .....

6. Annenizin işi : .....
   (Eğer çalışıyorsa çalıştığı kurumun adı ve bu kurumdaki görevini belirtiniz.)

7. Babanızın en son bitirdiği öğrenim kurumu :

   (a) ilkokul

   (b) orta okul

   (c) lise

   (d) meslek okulu

   (e) üniversite/yüksek okul

   (f) hiç gitmemiş

8. Babanızın mesleği : .....

9. Babanızın işi : .....
   (Eğer çalışıyorsa çalıştığı kurumun adı ve bu kurumdaki görevini belirtiniz.)

10. Kaç kardeşiniz var?

   (a) 1-2

   (b) 3-4

   (c) 5 veya daha çok

   (d) kardeşim yok

11. Üniversite seçme sınavı için aşağıdaki çalışmalardan hangisine katılıyorsunuz?
(Birden fazla seçenek işaretlenebilir.)

(a) Okulda açılan kurslara devam ediyorum

(b) Özel bir dersaneye devam ediyorum

(c) Özel bir öğretmen yardımıyla hazırlanıyorum/Özel ders alıyorum

(d) Kendi kendime hazırlanıyorum

(e) Başka (belirtiniz) .....

(f) Okul dışında hiç bir hazırlık yapmıyorum

Eğer 11. sorunun (b) seçeneğini işaretlediyseniz 12, 13, 14 ve 15. soruları cevaplayınız.

12. Şimdi devam ettiğiniz dersanenin adı : .....

13. Bu dersaneye başladığınız tarih : .....
(Ay-yıl olarak belirtiniz)

14. Bu dersaneye ne kadar süredir devam ediyorsunuz? (Ay ve yıl olarak belirtiniz) : .....

15. Bu dersaneye gitmeden önce devam ettiğiniz başka bir dersane var mı, varsa bu dersanenin adı nedir?

.....

16. (15.) soruda adı geçen dersaneye ne kadar süre devam ettiğinizi ay ve yıl olarak belirtiniz :

.....

17. Özel bir dersaneye devam etmiyorsanız ne tip bir hazırlık çalışması yapıyorsunuz?

.....

.....

18. Özel bir dersaneye devam etmiyorsanız diğer hazırlık çalışmalarını ne kadar süredir yapıyorsunuz?
(Ay ve yıl olarak belirtiniz.)

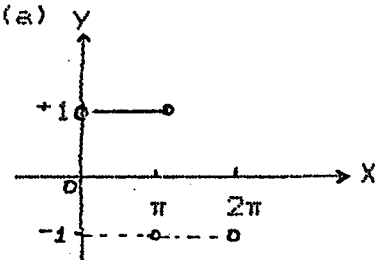
.....

SUBJECT AREA: MATHEMATICS

MATEMATİK ÖN-TEST

1. $y = \dfrac{\sin x}{|\sin x|}$ $x \in ((0,\pi) \cup (\pi,2\pi))$ fonksiyonunun grafiği aşağıdakilerden hangisidir?

(a)



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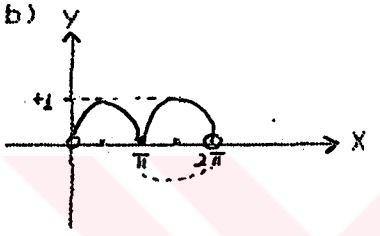

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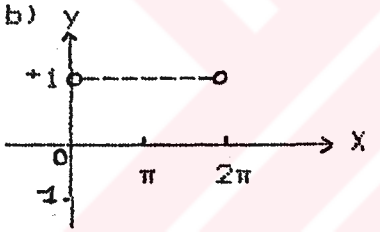

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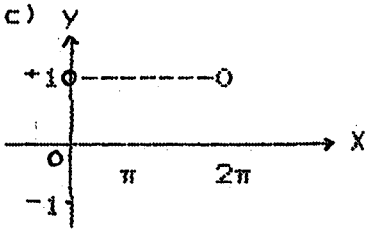
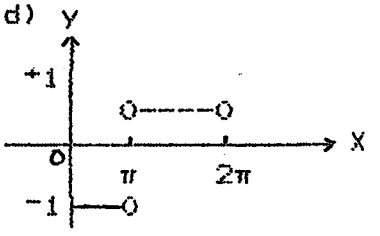
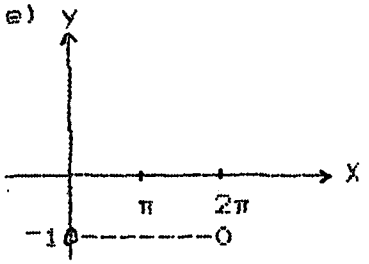


d)

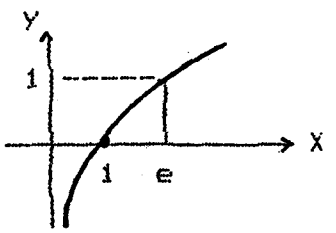


e)

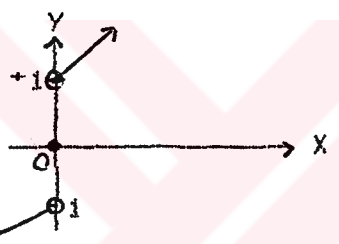


2. y=Sgn (lnx) fonksiyonunun grafiği hangisidir?

a)



b)



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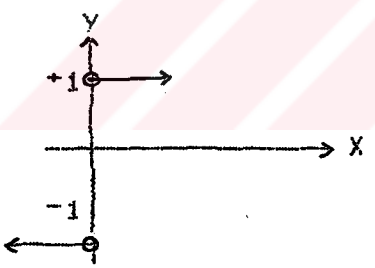
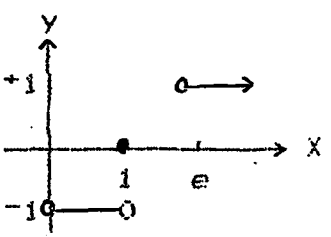
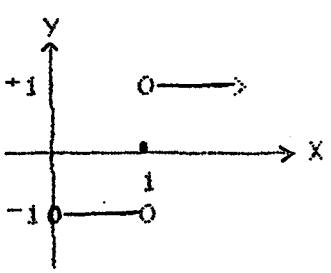
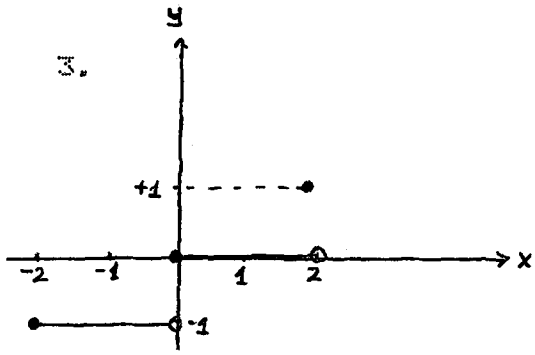


d)



(e)



3. 

Şekildeki grafik aşağıdaki fonksiyonlardan hangisine aittir? $x\in[-2,+2]$

(a) $f(x)=[\![x/2]\!]$
b) $f(x)=[\![2x]\!]$
c) $f(x)=2[\![x]\!]$
d) $f(x)=[\![/2x/]\!]$
e) $f(x)=2[\![x]\!]-1$

4. $[2x-4].\ Sgn(3x-4)=0,\ x\in\mathbb{R},\ Ç=?$

a) $\langle 2,4/3\rangle$

b) $[2,4)\cup\langle 4/3\rangle$

c) $[2,5/2)\cup\langle 0\rangle$

(d) $\{\langle 4/3\rangle\cup[2,5/2)\}$

e) $\{x\notin Z,\ [2,5/2)\}$

5. $f(x)=\sqrt{2-|x^2-2|}$ fonksiyonunun tanım aralığı aşağıdakilerden hangisidir?

(a) $[-2,+2]$

b) $[-\sqrt{2},+2]$

c) $[0,+\infty)$

d) $[-2,\sqrt{2})$

e) $[-\sqrt{2},+2)$

6. $\lim_{x\to 2^+}\left([\![-4x]\!]+Sgn(2-x)+\frac{|x-2|}{x-2}+3^{[\![x]\!]}\right)=?$ limiti hangisine eşittir?

a) 0

b) 1

(c) 2

d) 3

e) 4

7. $\lim_{x\to 0} \frac{5x+\sin 2x}{3x+4\sin 5x} = ?$ limiti aşağıdakilerden hangisine eşittir?

(a) 7/23

b) 3/20

c) 6/7

d) 5/2

e) 0

8. $\lim_{x\to\sqrt{2}} \frac{\sin(x^2-2)}{x-\sqrt{2}} = ?$ limiti aşağıdakilerden hangisidir?

a) 2

b) 1

c) 0

(d) $2\sqrt{2}$

e) $\sqrt{2}/2$

9. $\lim_{x\to-\infty} \frac{4x-7-\sqrt{25x^2+2x-1}}{6x+7} = ?$ limiti aşağıdakilerden hangisidir?

a) -1/6

(b) 3/2

c) 1/2

d) 1

e) 0

10. $\lim_{x\to\infty} \left(\ln\sqrt{ex^2}-\ln\sqrt{\frac{x^2}{e}+1}\right)=?$ limiti aşağıdakilerden hangisidir?

(a) 1

b) 2

c) 0

d) $+\infty$

e) e

11. $f(x)=\begin{cases}\dfrac{[\![x]\!]^2-4}{x-2}, & x>2\\ \dfrac{1}{2x}, & x\le 2\end{cases}$ fonksiyonu için aşağıdakilerden hangisi doğrudur?

a) $x_o=2$'de süreklidir.

b) $x_o=2$'de sağdan süreklidir.

(c) $x_o=2$'de süreksizdir.

d) $x_o=2$'de tanımsızdır.

e) $\forall_x \in \mathbb{R}$ için süreklidir.

12. $f(x)=x^2+[\![x]\!]+\mathrm{Sgn}(x-1)$, $f'\left(\frac{1}{2}\right)=?$ aşağıdakilerden hangisine eşittir?

(a) 1

b) 0

c) -2

d) 2

e) -1

13. $y=\sqrt{\ln 5^x}$, $y'=?$ aşağıdakilerden hangisine eşittir?

a) x^2

b) $\ln 5$

c) 1

(d) $1/x$

e) $1/x^2$

14. $2xy+3x-2y+3=0$ kapalı fonksiyonunun $x=0$'daki teğetinin eğimi aşağıdakilerden hangisidir?

a) 1

b) 2

(c) 3

d) 4

e) 5

15. $y=\ln\sqrt{x^3+8}+\ln(x^2+3)$, $y'(1)=?$ aşağıdakilerden hangisine eşittir?

a) 1/3

(b) 2/3

c) 1

d) 3/2

e) 2

16. $y=|x|-[\![x]\!]$, $x\in[-3,-2)$ ise $y=?$ aşağıdakilerden hangisine eşittir?

a) $y=x-2$

b) $y=x-3$

(c) $y=-x+3$

d) $y=-x+2$

e) $y=x+1$

17. $f(v)=2x-1$, $\sum_{n=1}^{10} n^2=385$, $\sum_{n=1}^{10} n=55$ ise

$\sum_{n=1}^{10} [f(n)]^2=?$ aşağıdakilerden hangisine eşittir?

a) 1320

(b) 1330

c) 1430

d) 1500

e) 1285

18. $Q_n=\left(\frac{n^2+5n-8}{n}\right)$ dizisinin kaç terimi bir tam sayıdır?

a) 3 terimi

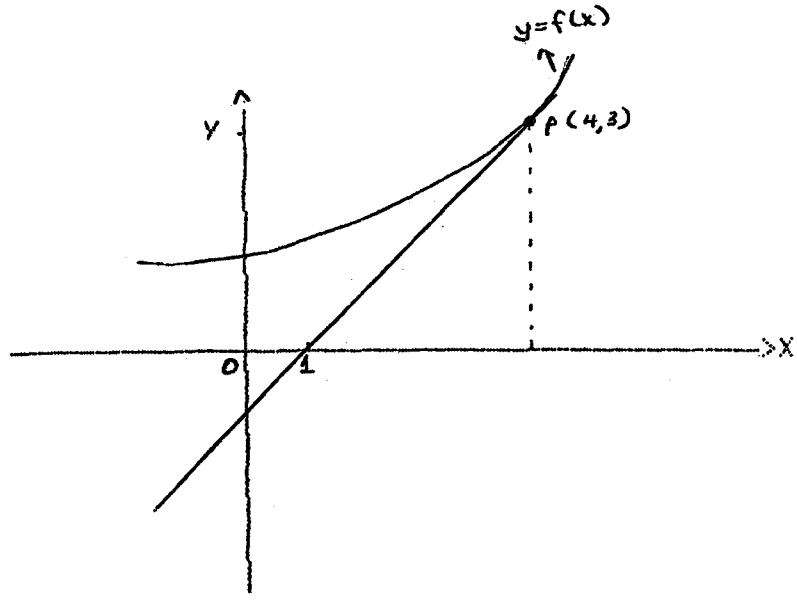
(b) 4 terimi

c) 5 terimi

d) 6 terimi

e) 2 terimi

19.



$h(x) = \dfrac{x}{f(x)}$ ise $h'(4) = ?$ aşağıdakilerden hangisine eşittir?

a) 5/9

b) 5/3

c) -5/3

(d) -5/9

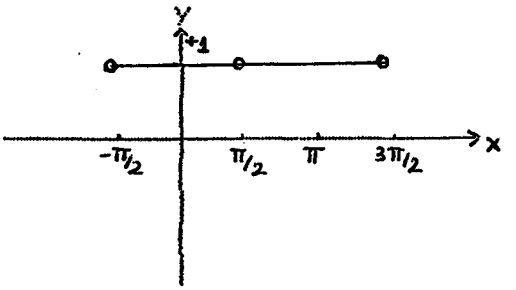
e) 1/2

MATEMATİK ÖN-TEST PARALELİ

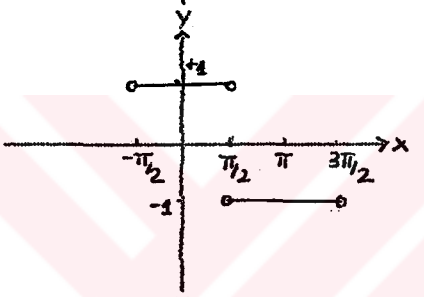
1. $y = \dfrac{\text{Cos } x}{|\text{Cos } x|}$, $x \in \{(\dfrac{-\pi}{2}, +\dfrac{\pi}{2}) \cup (\dfrac{\pi}{2}, \dfrac{3\pi}{2})\}$

Fonksiyonunun grafiği aşağıdakilerden hangisidir?

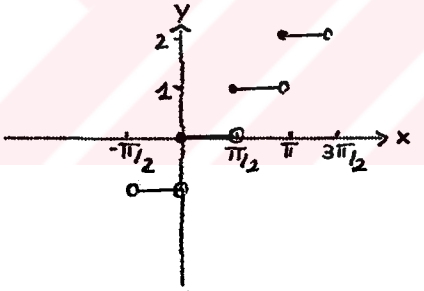
a)



(b)



c)



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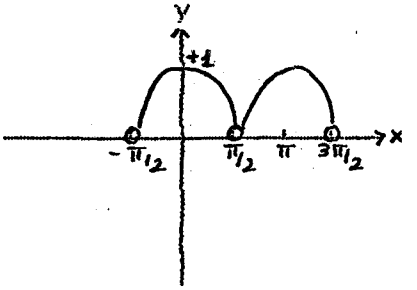
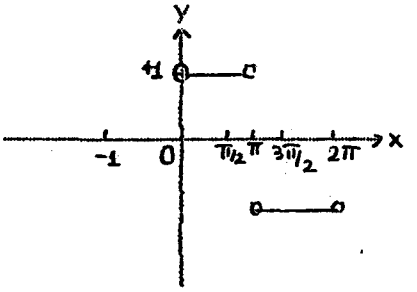
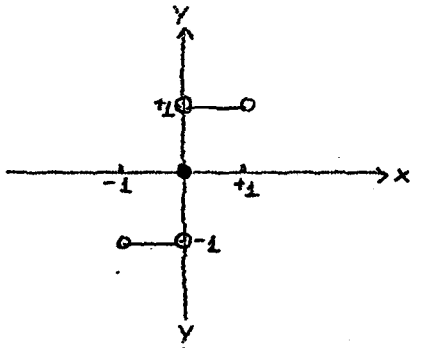


e)

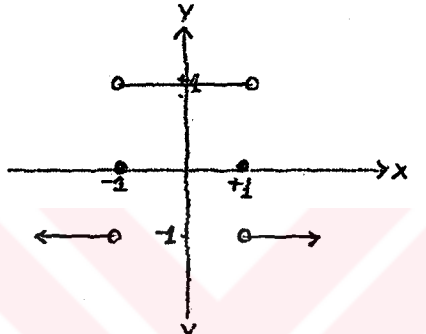


2. y=Sgn (x^2-1) fonksiyonunun grafiği aşağıdakilerden hangisidir?

a)



b)



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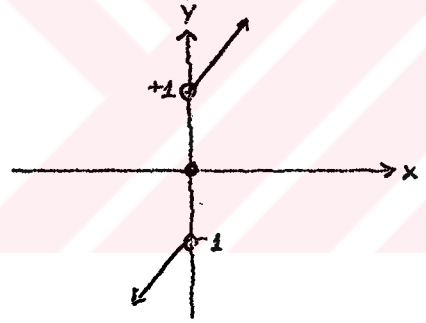
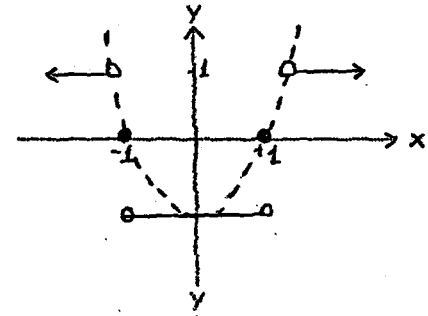
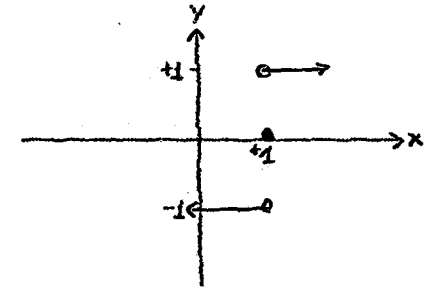


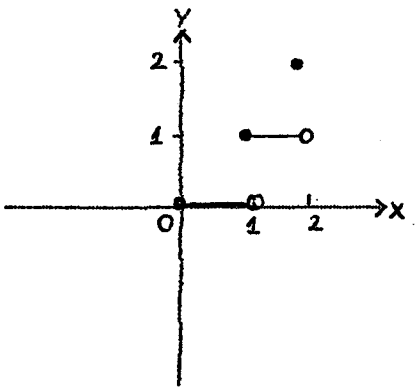
(d)



e)



3.



Şekildeki grafik aşağıdaki fonksiyonlardan hangisine aittir?

(a) $f(x)=[\![x]\!]$

b) $f(x)=[\![2x]\!]$

c) $f(x)=\left[\!\left[\frac{x}{2}\right]\!\right]$

d) $f(x)=[\![|x|]\!]$

e) $f(x)=[\![x]\!]^{-1}$

4. $[\![3x-6]\!]\ \mathrm{Sgn}(2x-4)=0 \quad x\in\mathbb{R}, \quad Ç=?$

a) $\left(2, \frac{1}{2}\right\rangle$

b) $\langle[1,2)\rangle$

(c) $\left\langle[2, \frac{7}{3}\right)\cup\langle 2\rangle\rangle$

d) $\langle[2,3)\cup\langle 1\rangle\rangle$

e) $\left\langle x\notin Z\left(2, \frac{7}{3}\right)\right\rangle$

5. $f(x)=\sqrt{[1-|x^2-1|}$ fonksiyonunun tanım aralığı aşağıdakilerden hangisidir?

a) $(-\infty, 0]$

b) $[1, +\infty)$

c) $(-\sqrt{2}, +\sqrt{2})$

d) $[-2, +2]$

(e) $[-\sqrt{2}, +\sqrt{2}]$

6. $\lim_{x\to 2^-} (\|3x\|+Sgn(x-2)+\frac{|x-2|}{x-2}+1^{\pi\times 3})=?$ limiti aşağıdakilerden hangisine eşittir?

a) 2

b) 3

(c) 4

d) 1

e) 0

7. $\lim_{x\to 0} \frac{2x+Sin3x}{5x+7Sin4x}=?$ limiti aşağıdakilerden hangisine eşittir?

(a) $\frac{5}{33}$

b) $\frac{2}{5}$

c) $\frac{-5}{32}$

d) $\frac{3}{28}$

e) $\frac{3}{7}$

8. $\lim_{x\to 0} \left(\frac{2^x-1}{\sin 2x}\right)$ =? limiti aşağıdakilerden hangisidir?

a) 1

b) $\frac{2}{\cos 2x}$

c) $\frac{\ln 2}{\sin 2x}$

(d) $\ln\sqrt{2}$

e) $\frac{1}{2}$

9. $\lim_{x\to -\infty} (x+3+\sqrt{x^2+4x+1}$ =? Limiti aşağıdakilerden hangisidir?

a) -1

(b) 1

c) -2

d) 2

e) 0

10. $\lim_{x\to\infty} \frac{x^3-x^2+3x-1}{x^2+2x^3-5}$ =? Limiti aşağıdakilerden hangisidir?

a) $+\infty$

b) $-\infty$

c) 1

d) 0

(e) ½

11. $\lim_{x\to\infty} (\ln e^{2x} - \ln \frac{x}{e}) = ?$ Limiti aşağıdakilerden hangisidir?

a) 4

(b) 3

c) 2

d) 1

e) 0

12. $f(x) = \begin{cases} x^2-3x, & 3<x<6 \\ 3x, & x\geq 6 \end{cases}$ fonksiyonu için aşağıdakilerden hangisi doğrudur?

a) x=3 için süreklidir

b) x=4 için süreklidir

c) x=6 için süreksizdir

(d) x=6 için süreklidir

e) x=2 için tanımsızdır

13. $f(x)=x^3+|3x-4|+\text{Sgn}(2x+1)$ olsun, $f^{-1}(\frac{1}{\sqrt{3}}) = ?$ aşağıdakilerden hangisine eşittir?

(a) 1

b) -1

c) 2

d) -2

e) 3

14. $f(x)=\sqrt{\ln e^x}$ ise $f^1(4)=?$ aşağıdakilerden hangisine eşittir?

a) $\frac{1}{2}$

b) $\frac{1}{3}$

(c) $\frac{1}{4}$

d) $-\frac{1}{4}$

e) $-\frac{1}{2}$

15. $x^2+xy^3-2x+3y=0$ fonksiyonunun $(0,1)$ noktasındaki teğetinin eğimi aşağıdakilerden hangisidir?

a) $\frac{1}{2}$

b) $-\frac{1}{3}$

c) $\frac{2}{3}$

d) $-\frac{2}{3}$

(e) $\frac{1}{3}$

16. $y=\ln(x^2+3)+\ln \cos x$ ise $y'(0)=?$ aşağıdakilerden hangisine eşittir?

a) 4

b) 3

c) 2

d) 1

(e) 0

17. $y=|2x|+[x]$, $x\in[3,4)$ ise $y=?$ aşağıdakilerden hangisine eşittir?

a) $y=2x+1$

b) $y=2x+2$

c) $y=2x-3$

(d) $y=2x+3$

e) $y=x$

18. $f(x)=x+1$, $\sum_{n=1}^{5} n^2=55$, $\sum_{n=1}^{5} n=15$ ise $\sum_{n=1}^{5} [f(n)]^2=?$
aşağıdakilerden hangisine eşittir?

a) 80

b) 85

(c) 90

d) 95

e) 100

19. $Q_n=\left(\dfrac{n^2-5n+12}{n}\right)$ dizisinin kaç terimi bir tam sayıdır?

(a) 6 terimi

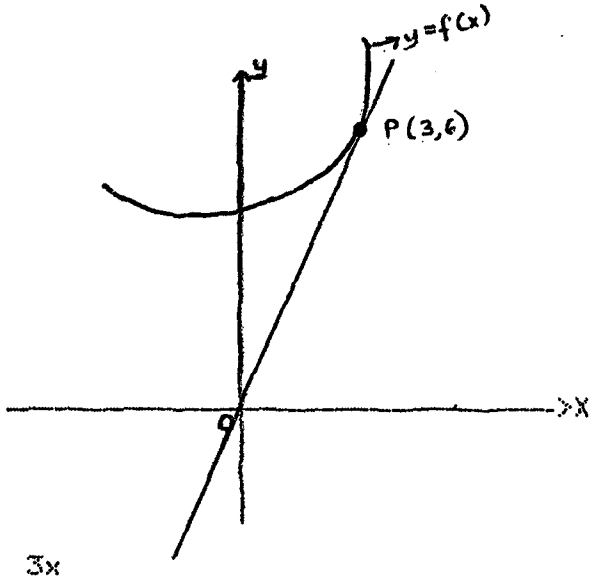
b) 4 terimi

c) 2 terimi

d) 1 terimi

e) 7 terimi

20.



$h(x) = \dfrac{3x}{f(x)}$ ise $h'(3)$=? aşağıdakilerden hangisine eşittir?

a) -2

(b) 0

c) 2

d) 1

e) -1

SUBJECT AREA MATHEMATICS

There were 3 learning units to be covered for Mathematics in the second semester. These learning units were:

Unit 4 : Integrals

Unit 5 : Linear Algebra

Unit 6: Analytic Geometry

Unit 4 was divided into 3 learning tasks:

Unit 4 : Integrals

Learning Task 1 : The Definition of the Concept of Integral and Different Techniques of Integration

Learning Task 2 : The Integration of Special Functions

Learning Task 3 : Area and Volume Calculations

Unit 5 was divided into 2 learning tasks:

Unit 5 : Linear Algebra

Learning Task 4 : Matrices

Learning Task 5 : Determinants

Unit 6 was divided into 2 learning tasks:

Learning Task 6 : Lines

Learning Task 7 : Circles

For the subject area of Mathematics, there were 7 learing tasks in these 3 units. The learning units of the study were Units 4, 5 and 6 of the textbook, Matematik Lise 3 by A.Yılmaz, O.Altıntaş, D.Çoker, F.Yıldırım and M.Zirek, published by the Ministry of Education, Youth and Sports 1986.

I. ÖĞRENME BİRİMİ: İNTEGRAL KAVRAMININ BELİRLENMESİ VE İNTEGRAL ALMA YÖNTEMLERİ

Öğrenme Hedefleri:

1. Öğrenciler bir fonksiyon verildiğinde alt sınırını bulabilmelidirler.

2. Öğrenciler bir fonksiyon verildiğinde üst sınırını bulabilmelidirler.

3. Öğrenciler bir fonksiyonun sınırlı olup olmadığını bulabilmelidirler.

4. Öğrenciler belirli integralin matematiksel tanımını verebilmelidirler.

5. Öğrenciler verilen bir aralıkta sınırlı olan bir fonksiyonun hangi durumda integrallenebileceğini bulabilmelidirler.

6. Öğrenciler verilen fonksiyonların integrallerinin olup olmadığını bulabilmelidirler.

7. Öğrenciler belirli aralıklarda integrallenebilen herhangi iki fonksiyon verildiğinde, bu iki fonksiyonun toplamının integralini, bu iki fonksiyonun integrallerinin toplamına eşitleyerek bulabilmelidirler.

8. Öğrenciler herhangi bir fonksiyonun reel bir sayıyla çarpımının belirli bir aralıkta integralini bulabilmelidirler.

9. Öğrenciler verilen herhangi bir fonksiyonun aynı iki reel sayı arasındaki integralini bulabilmelidirler.

10. Öğrenciler iki ayrı reel sayı arasında verilen herhangi bir fonksiyonun integralinin neye eşit olduğunu bulabilmelidirler.

11. Ogrenciler integralin 1. temel teoremini verilen bir fonksiyona uygulayabilmelidirler.

12. Öğrenciler türevi verilen bir fonksiyonun ilkelini bulabilmelidirler.

13. Öğrenciler verilen bir fonksiyonun herhangi bir aralıktaki integralini, integralin 2. temel teoremine göre bulabilmelidirler.

14. Öğrenciler herhangi bir fonksiyon verildiğinde basit integral kurallarını kullanarak bir fonksiyonun belirli bir aralıktaki integralini bulabilmelidirler.

15. Öğrenciler yerine koyma kuralını (değişken dönüşümünü) kullanarak verilen bir fonksiyonun integralini alabilmelidirler.

16. Ogrenciler kısmı integralleme kuralını kullanarak verilen bir fonksiyonun integralini alabilmelidirler.

17. Öğrenciler basit kesirlere ayırma yöntemini kullanarak verilen bir fonksiyonun integralini alabilmelidirler.

18. Öğrenciler trigonometrik dönüşümleri kullanarak verilen bir fonksiyonun integralini hesaplayabilmelidirler.

19. Öğrenciler herhangi bir fonksiyon verildiğinde bu fonksiyonu uygun olan integral alma yöntemiyle integralleyebilmelidirler.

II. ÖĞRENME BİRİMİ: ÖZEL FONKSİYONLARIN İNTEGRALİ

Öğrenme Hedefleri:

1. Öğrenciler mutlak bir fonksiyonun belirli aralıklardaki integralini bulabilmelidirler.

2. Öğrenciler bir tam değer fonksiyonun belirli aralıklardaki integralini bulabilmelidirler.

3. Öğrenciler bir işaret fonksiyonun (sgn.) belirli aralıklardaki integralini bulabilmelidirler.

III. ÖĞRENME BİRİMİ: ALAN VE HACİM HESAPLARI

Öğrenme Hedefleri:

1. Öğrenciler y=mx doğrusu ile eksenler arasında kalan alanı hesaplayabilmelidirler.

2. Öğrenciler herhangi bir doğru ile eksenler arasında kalan alanı hesaplayabilmelidirler.

3. Öğrenciler herhangi bir doğru ile verilen X-doğruları ve x-ekseni arasında kalan alanı hesaplayabilmelidirler.

4. Öğrenciler herhangi bir eğri ile verilen x-ekseni arasında kalan alanı hesaplayabilmelidirler.

5. Öğrenciler herhangi bir eğri ile verilen X-doğruları ve x-ekseni arasındaki alanı hesaplayabilmelidirler.

6. Öğrenciler herhangi bir eğri ile bir doğru arasında kalan alanı hesaplayabilmelidirler.

7. Öğrenciler herhangi iki eğri arasında kalan alanı hesaplayabilmelidirler.

8. Öğrenciler herhangi bir aralıkta iki doğru ve x-ekseni ile sınırlanan bölgenin alanını bulabilmelidirler.

9. Öğrenciler verilen x-doğruları veya herhangi bir eğri ile sınırlanan bölgeyi x-ekseni etrafında döndürerek oluşturulan dönel cismin hacim formülünü matematiksel olarak ifade edebilmelidirler.

10. Öğrenciler verilen x-doğruları veya herhangi bir eğri ile sınırlanan bölgeyi x-ekseni etrafında döndürerek oluşturulan dönel cismin hacmini hesaplayabilmelidirler.

11. Öğrenciler verilen y-doğruları veya herhangi bir eğri ile sınırlanan bölgeyi y-ekseni etrafında döndürerek oluşturulan dönel cismin hacim formülünü matematiksel olarak ifade edebilmelidirler.

12. Öğrenciler verilen y-doğruları veya herhangi bir eğri ile sınırlanan bölgeyi y-ekseni etrafında döndürerek oluşturulan dönel cismin hacmini hesaplayabilmelidirler.

IV. ÖĞRENME BİRİMİ: MATRİSLER

Öğrenme Hedefleri:

1. Öğrenciler $(a_{i,j})$ şeklinde verilen bir ifadenin matris içindeki yerini hesaplayabilmelidirler.
2. Öğrenciler matrislerin özelliklerini belirleyebilmelidirler.
3. Öğrenciler iki matrisin eşitliğinden faydalanarak bir matrisin elemanlarının değerlerini bulabilmelidirler.
4. Öğrenciler verilen bir matrisin transpozesini bulabilmelidirler.
5. Öğrenciler bir matrisin transpozesinin transpozesinin kendisine eşit olduğunu belirleyebilmelidirler.
6. Öğrenciler bir matrisin simerik olup olmadığını belirleyebilmelidirler.
7. Öğrenciler bir matrisin antisimetrik olup olmadığını belirleyebilmelidirler.

8. Öğrenciler köşegen matrislerin özelliklerinden yararlanarak verilen matrisler arasından köşegen bir matrisi belirleyebilmelidirler.

9. Öğrenciler bir matrisin negatifini hesaplayabilmelidirler.

10. Öğrenciler matrislerin toplamı ile ilgili özellikleri belirleyebilmelidirler.

11. Öğrenciler verilen iki matrisin toplama özelliklerini kullanarak bilinmeyen değerleri hesaplayabilmelidirler.

12. Öğrenciler verilen bir matrisin bir skalerle çarpımını hesaplayabilmelidirler.

13. Öğrenciler dağılma özelliğini matrislere uygulayabilmelidirler.

14. Öğrenciler iki matrisin çarpımında sonuç matrisin satır ve sütun sayısını hesaplayabilmelidirler.

15. Öğrenciler iki matrisi çarpabilmelidirler.

16. Öğrenciler iki matrisin çarpımının sonucunda çıkan matris verildiği zaman verilmeyen matrislerden birini hesaplayabilmelidirler.

17. Öğrenciler bir matrisin karesini hesaplayabilmelidirler.

18. Öğrenciler içinde matrislerin kullanıldığı denklemlerde sorulan değişkeni bulabilmelidirler.

V. ÖĞRENME BİRİMİ: DETERMİNANTLAR

Öğrenme Hedefleri:

1. Öğrenciler $A_{2\times2}$ tipindeki bir determinantın açılımını hesaplayabilmelidirler.

2. Öğrenciler $A_{2\times2}$ tipindeki ve sonucu verilen bir determinantın bilinmeyen elemanını hesaplayabilmelidirler.

3. Öğrenciler üçüncü dereceden bir determinantın sonucunu herhangi bir kurala göre hesaplayabilmelidirler.

4. Öğrenciler üçüncü dereceden ve sonucu verilen bir determinantın bilinmeyen elemanını hesaplayabilmelidirler.

5. Öğrenciler determinantların eşitliğinden faydalanarak bilinmeyen elemanı hesaplayabilmelidirler.

6. Öğrenciler bir determinantın herhangi bir elemanının eşçarpanını (kofaktörünü) hesaplayabilmelidirler.

7. Öğrenciler bir determinantın herhangi bir elemanının minörunu hesaplayabilmelidirler.

8. Öğrenciler herhangi bir kare matriste iki satır veya iki sütunun terimlerinin aynı olması halinde determinantın sıfıra eşit olduğunu belirleyebilmelidirler.

9. Öğrenciler bir determinantta iki satır veya iki sütunun elemanlarının birbirine orantılı olması durumunda determinantın değerinin 0'a eşit olduğunu belirleyebilmelidirler.

10. Öğrenciler bir determinantta bir satırın veya bir sütunun tüm elemanlarının sıfır olması durumunda determinantın değerinin 0'a eşit olduğunu belirleyebilmelidirler.

11. Öğrenciler bir determinantta bir satır veya bir sütunun tüm elemanlarının bir K∈R sayısı ile çarpıldığında yeni determinantın ilk determinantın K katı olduğunu belirleyebilmelidirler.

12. Öğrenciler bir determinantta, bir satıra veya bir sütuna başka bir satır veya sütunun bir skalerle çarpılması eklendiğinde determinantın değerinin değişmediğini belirleyebilmelidirler.

13. Öğrenciler bir determinantın rankını hesaplayabilmelidirler.

14. Öğrenciler kramer kuralını kullanarak üç bilinmeyenli üç denklemin çözüm kümesini hesaplayabilmelidirler.

VI. ÖĞRENME BİRİMİ: DOĞRUNUN ANALİTİK İNCELENMESİ

Öğrenme Hedefleri:

1. Öğrenciler koordinatları verilen iki nokta arasındaki uzaklığı hesaplayabilmelidirler.

2. Öğrenciler arasındaki uzaklık ve noktalardan herhangi birinin koordinatları verildiğinde diğer noktanın apsisini veya ordinatını hesaplayabilmelidirler.

3. Öğrenciler koordinatları belli iki noktanın oluşturduğu doğru parçasının orta noktasının koordinatlarını hesaplayabilmelidirler.

4. Öğrenciler orta noktasının koordinatları verilen ve koordinatlardan biri verilen noktalardan diğerinin apsis ve ordinatını hesaplayabilmelidirler.

5. Öğrenciler koordinatları verilen bir noktanın OY eksenine göre simetriğini bulabilmelidirler.

6. Öğrenciler koordinatları verilen bir noktanın OX eksenine göre simetriğini bulabilmelidirler.

7. Öğrenciler koordinatları verilen bir noktanın başlangıç noktasına göre simetriğini bulabilmelidirler.

8. Öğrenciler koordinatları verilen bir noktanın birinci açı ortaya göre simetriğini bulabilmelidirler.

9. Öğrenciler koordinatları verilen bir noktanın ikinci açı ortaya göre simetriğini bulabilmelidirler.

10. Öğrenciler koordinatları verilen bir noktanın X=a doğrusuna göre simetriğini bulabilmelidirler.

11. Öğrenciler koordinatları verilen bir noktanın y=a doğrusuna göre simetriğini bulabilmelidirler.

12. Öğrenciler bir doğrunun herhangi λ oranındaki noktasının koordinatlarını hesaplayabilmelidirler.

13. Öğrenciler geçtiği noktaların koordinatları verilen bir doğrunun eğimini hesaplayabilmelidirler.

14. Öğrenciler bir noktasının koordinatı ve eğimi verilen bir doğrunun denklemini oluşturabilmelidirler.

15. Öğrenciler iki noktanın koordinatları verildiğinde bu noktalardan geçen doğrunun denklemini oluşturabilmelidirler.

16. Öğrenciler iki noktadan geçen bir doğrunun denklemi verildiğinde ve bu noktalardan bir tanesinin koordinatları belliyken, diğer noktanın apsis veya ordinatını hesaplayabilmelidirler.

17. Öğrenciler verilen iki doğrunun birbirine paralel olduğunu eğimlerini bularak hesaplayabilmelidirler.

18. Öğrenciler verilen iki doğrunun birbirine dik olduğunu eğimini bularak hesaplayabilmelidirler.

19. Öğrenciler verilen iki doğru arasındaki açıyı hesaplayabilmelidirler.

20. Öğrenciler bir doğru denklemi, bir açı ve o açıyla kesişen başka bir doğrunun bir noktası verildiğinde öbür doğrunun denklemini oluşturabilmelidirler.

21. Öğrenciler bir noktanın bir doğruya olan uzaklığını hesaplayabilmelidirler.

22. Öğrenciler paralel iki doğru arasındaki uzaklığı hesaplayabilmelidirler.

23. Öğrenciler kesişen iki doğrunun meydana getirdiği açının açı ortay denklemini oluşturabilmelidirler.

24. Ögrenciler doğru demetinin denklemini oluşturabilmelidirler.

VII. ÖĞRENME BİRİMİ: ÇEMBERİN ANALİTİK İNCELENMESİ

Öğrenme Hedefleri:

1. Öğrenciler merkezi başlangıç noktası olan çemberin denklemini oluşturabilmelidirler.

2. Öğrenciler merkezi X-ekseni üzerinde ve koordinatları (a,b) olan çemberin denklemini oluşturabilmelidirler.

3. Öğrenciler merkezi y-ekseni üzerinde ve koordinatları (a,b) olan çemberin denklemini oluşturabilmelidirler.

4. Öğrenciler merkezi (a,b) olan ve OX eksenine teğet olan çemberin denklemini oluşturabilmelidirler.

5. Öğrenciler merkezi (a,b) olan ve OY eksenine teğet olan çemberin denklemini oluşturabilmelidirler.

6. Öğrenciler OX ve OY eksenine teğet olarak verilen çember denklemindeki sabitler (a, b, r) arasındaki ilişkiyi belirleyebilmelidirler.

7. Öğrenciler merkezi (a,b) olan ve OX ve OY eksenlerine teğet olan çemberin denklemini oluşturabilmelidirler.

8. Öğrenciler verilen bir çember denkleminin koordinat sistemine göre konumunu belirleyebilmelidirler.

9. Öğrenciler çember denklemi ile ilgili eşitsizliklerin sınırladığı bölgeyi belirleyebilmelidirler.

10. Öğrenciler çemberin kapalı denkleminden faydalanarak çemberin merkezinin koordinatlarını hesaplayabilmelidirler.

11. Öğrenciler çemberin kapalı denkleminden faydalanarak çemberin yarıçapını hesaplayabilmelidirler.

12. Öğrenciler çemberden geçen üç nokta verildiğinde çember denklemini oluşturabilmelidirler.

13. Öğrenciler apsisi (x) veya ordinatı (y) belli olan bir noktanın çemberin içinde, üzerinde veya dışında olması durumlarından herhangi biri verildiğinde, çemberin

kapalı denkleminden faydalanarak belli olmayan koordinatı hesaplayabilmelidir.

14. Öğrenciler merkezcil çember denklemi üzerindeki bir (x_o, y_o) noktasından çizilen teğetin denklemini oluşturabilmelidirler.

15. Öğrenciler denklemi $(x-a)^2 + (y-b)^2=r^2$ olan çembere üzerindeki bir noktadan çizilen teğetin denklemini oluşturabilmelidirler.

16. Öğrenciler denklemi verilen bir çemberin normal denklemini oluşturabilmelidirler.

17. Öğrenciler verilen iki çemberin kuvvet eksenini hesaplayabilmelidirler.

18. Öğrenciler bir doğru ile bir çemberin arakesitinin koordinatlarını hesaplayabilmelidirler.

19. Öğrenciler merkezinin koordinatları ve teğetin denklemi verilen bir çemberin denklemini oluşturabilmelidirler.

LEARNING UNIT: INTEGRALS

I. ÖĞRENME BİRİMİ: İNTEGRAL

KAVRAMININ BELİRLENMESİ VE İNTEGRAL ALMA YÖNTEMLERİ

İZLEME TESTI I A

1. $f(x)=(x+1)^2+3$ fonksiyonun sınırı aşağıdakilerden hangisidir?

   (a) Alttan sınırı 3

   b) Üstten sınırı 3

   c) Alttan sınırı 2

   d) Üstten sınırı 2

   e) Sınırsız

2. $f(x)=-x^2+2$ fonksiyonun sınırı aşağıdakilerden hangisidir?

   a) Üst sınırı yoktur

   b) Alttan sınırı 2

   (c) Üstten sınırı 2

   d) Sınırsızdır

   e) Üstten sınırı 1

3. $f(x)=2 \cos 2x+1$ fonksiyonun sınırları aşağıdakilerden hangisidir?

   a) Üstten sınırı -1, alttan sınırı -3

   b) Üstten sınırı 1, alttan sınırı -3

   c) Üstten sınırı 3, alttan sınırsız

   d) Alttan sınırı -1, üstten sınırsız

   (e) Üstten sınırı 3, alttan sınırı -1

4. Aşağidaki ifadelerden hangisi belirli integrali tanımlar?

(a) Bir eğrinin altında kalan alanı verir.

b) Bir eğrinin eğimini verir.

c) Bir eğrinin dönüm noktasını verir.

d) Bir eğrinin extramum noktalarını verir.

e) Bir eğrinin denklemini verir.

5. Aşağıdaki fonksiyonlardan hangisinin [0,3] aralığında integrali alınabilir?

a)
$$f(x)=\begin{cases} x+1, & 0\le x<1 \\ x, & 2<x<3 \end{cases}$$

b)
$$f(x)=\frac{1}{(x-1)^2}$$

(c)
$$f(x)=\begin{cases} \dfrac{1}{x^2+1}, & 0\le x<1 \\ x, & 1<x\le 3 \end{cases}$$

d)
$$f(x)=\operatorname{tg}\frac{\pi x}{4}$$

e)
$$f(x)=\begin{cases} \dfrac{1}{x^2+1}, & 0\le x<1 \\ \dfrac{1}{x^2-4}, & 1\le x\le 3 \end{cases}$$

6. Aşağıdaki fonksiyonlardan hangisinin integrali vardır?

(a) $\int_0^5 (x^2+3x+2)\,dx$

b) $\int_0^2 \frac{1}{3x^2}\,dx$

c) $\int_0^4 \ln x.dx$

d) $\int_0^{\pi/2} \tan x.dx$

e) $\int_0^{\pi/2} \sec x.dx$

7. $\int_a^b f(x)\,dx=4$ $\int_a^b g(x)dx=-2$ ise

$\int_a^b [2f(x)+4g(x)]\,dx$ kaçtır?

a) 2

b) -8

(c) 0

d) -2

e) 6

8. Aşağıdaki matematiksel ifadelerden hangisi doğrudur?

a) $\int \frac{3x^3+7x}{2x^2+4x}\,dx = \frac{3}{2}\int \frac{x^3+7x}{x^2+2x}\,dx$

b) $\int \frac{6x+12}{4x^3+10x^2+6}\,dx = \frac{3}{2}\int \frac{3x+6}{2x^3+5x^2+3}\,dx$

(c) $\int (3\ln x-3)\,dx = 3\int (\ln x-1)\,dx$

d) $\int \frac{3x^2+1}{6x} = 3\int \frac{x^2+1}{2x}$

e) $\int \sin 2x dx = 2\int \sin x dx$

9. $f(x)=\int_{4}^{x^2} t^3.dt$ ise $f(2)$ kaçtır?

(a) 0

b) 2

c) 4

d) 6

e) 8

10. $\int_{2}^{4} (3x^2-4x)dx$ ifadesinin eşiti nedir?

a) 16

(b) 32

c) 64

d) 33

e) 18

11. $f(x)=\int_{1}^{\cos x} 2t\ dt$ ise $f'(x)$ aşağıdakilerden hangisidir?

a) Sin 2x

b) $\sin^2 x$

(c) $-\sin 2x$

d) $\cos^2 x$

e) $-\cos 2x$

12. $f'(x)=\sqrt{x-1}$ ve $f(2)=1$ olduğuna göre $f(5)$ aşağıdakilerden hangisidir?

a) $\frac{5}{3}$

b) $\frac{10}{3}$

c) $\frac{14}{3}$

(d) $\frac{17}{3}$

e) $\frac{20}{3}$

13. $\int_2^3 (x^2-1)dx$ ifadesinin eşiti nedir?

a) $\frac{32}{3}$

(b) $\frac{16}{3}$

c) $\frac{16}{6}$

d) $\frac{16}{5}$

e) $\frac{16}{7}$

14. $\int \frac{-1}{1+x^2}\,dx$ ifadesinin eşiti nedir?

a) $Arctanx+c$

b) $\sqrt{1+x^2}+c$

(c) $ArcCotx+c$

d) $\ln(1+x^2)+c$

e) $ArcSinx+c$

15. $\int \left(\frac{12x^2+16x}{x^3+2x^2+4}\right)dx$ ifadesinin eşiti nedir?

a) $4\sqrt{x^3+2x^2+4}$

b) $\sqrt{x^3+2x^2+4}$

(c) $4\ln|x^3+2x^2+4|$

d) $\ln|x^3+2x^2+4|$

e) $\frac{1}{x^3+2x^2+4}$

16. $\int xCosxdx$ ifadesinin eşiti nedir?

a) $xCosc+Sinx+c$

(b) $xSinx+Cosx+c$

c) $-xCosx+Sinx+c$

d) $-xSinx+Cosx+c$

e) $-xSinx-Cosx+c$

17. $\int \frac{x\,dx}{(x+2)\,(x-4)}$ ifadesinin eşiti aşağıdakilerden hangisidir?

a) $\ln|x+2|+\ln|x-4|+c$

b) $\frac{1}{3}\ln|x+2|-\frac{1}{3}\ln|x-4|+c$

c) $\frac{1}{3}\ln|x+2|+\frac{1}{3}\ln|x-4|+c$

(d) $\frac{1}{3}\ln|x+2|+\frac{2}{3}\ln|x-4|+c$

e) $\frac{1}{3}\ln|x+2|-\frac{2}{3}\ln|x-4|+c$

18. $\int \left(\frac{\cos^2 x}{1+\sin x}\right) dx$ ifadesinin eşiti aşağıdakilerden hangisidir?

a) $\frac{1}{x}+\frac{1}{x}\cos x+c$

b) $-x-\cos x+c$

c) $\frac{1}{x}\cos x+c$

(d) $x+\cos x+c$

e) $x^2+\cos^2 x+c$

19. $\int \frac{2x+2}{(x^2+2x+2)}\,dx$ ifadesinin eşiti nedir?

a) $\sqrt{x^2+2x+2}+c$

b) $-\sqrt{x^2+2x+2}+c$

(c) $\ln|x^2+2x+2|+c$

d) $-\ln|x^2+2x+2|+c$

e) $\ln|2x+2|+c$

II. ÖĞRENME BİRİMİ: ÖZEL FONKSİYONLARIN İNTEGRALİ

İZLEME TESTİ II A

1. $\int_0^3 |x^2-2x|dx$ ifadesinin eşiti aşağıdakilerden hangisidir?

   a) 4

   b) 3/8

   (c) 8/3

   d) −2

   e) 2

2. $\int_{-3}^{3} (|1x^2-4|+x)dx$ ifadesinin eşiti aşağıdakilerden hangisidir?

   a) 72/6

   b) 12

   (c) 32/6

   d) 92/6

   e) 102/6

3. $\int_{-\pi}^{\pi} |Sinx|dx$ ifadesinin eşiti aşağıdakilerden hangisidır?

   a) 0

   b) 3

   c) 2

   (d) 4

   e) −4

4. $\int_0^3 [x+1].(x+1).dx$ ifadesinin eşiti aşağıdakilerden hangisidir?

a) 13

b) 15

(c) 17

d) 19

e) 21

5. $\int_1^4 [x]^{x+2}\,dx$ ifadesinin eşiti aşağıdakilerden hangisidir?

a) 28

b) 30

c) 31

(d) 32

e) 33

6. $\int_{\pi}^{2\pi} [\sin x].\sin x.dx$ ifadesinin eşiti aşağıdakilerden hangisidir?

a) -2

b) -1

c) 0

d) 1

(e) 2

7. $\int_{2}^{7}$ Sgn (x+1) dx ifadesinin eşiti aşağıdakilerden hangisidir?

a) 4

b) 7

(c) 5

d) -7

e) 6

8. $\int_{-1}^{2}$ Sgn (x^2-5)dx ifadesinin eşiti aşağıdakilerden hangisidir?

(a) -3

b) 3

c) -4

d) 4

e) 5

9. $\int_{0}^{5}$ Sgn ($-x^2+3x$) dx ifadesinin eşiti aşağıdakilerden hangisidir?

a) -1

(b) 1

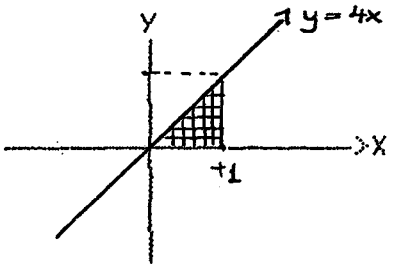
c) 2

d) -2

e) 3

III. ÖĞRENME BİRİMİ: ALAN VE HACİM HESAPLARI

İZLEME TESTI III A

1. 

Şekildeki taralı alanın sonucu aşağıdakilerden hangisidir?

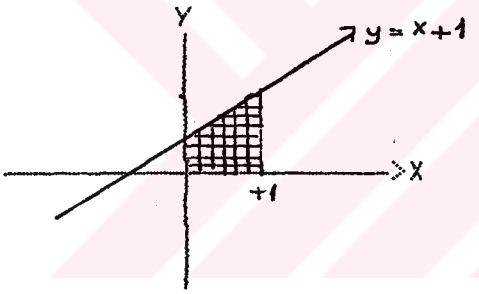
a) 3/2

(b) 2

c) 3

d) 4/3

e) 4

2. 

Şekildeki taralı alanın sonucu aşağıdakilerden hangisidir?

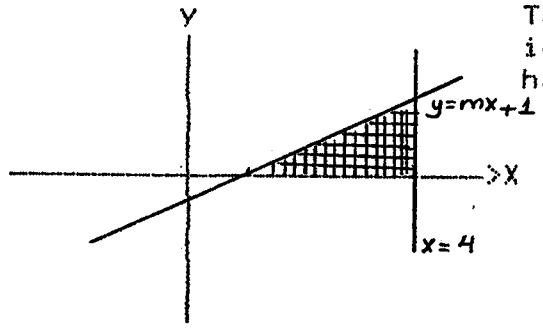
(a) 3/2

b) 2

c) 1

d) 1/2

e) 5/2

3. 

Taralı alanın 4 br² olması için "m" aşağıdakilerden hangisi olmalıdır?

a) 2

b) $2+\sqrt{2}$

(c) $\frac{2+\sqrt{3}}{4}$

d) $\frac{2+\sqrt{2}}{4}$

e) $\frac{\sqrt{3}}{2}+2$

4. $y=x^2-9$ eğrisi ile $y=0$ (x ekseni) arasındaki bölgenin alanı nedir?

a) 14

(b) 36

c) 26/3

d) 52/3

e) 16

5. $y=x^2+1$, $y=0$ (x ekseni) $x=0$, $x=1$ arasındaki bölgenin alanı nedir?

a) 2/5

(b) 4/3

c) 3/4

d) 4/7

e) 5/2

6. $y=\ln x$, $x=1$, $x=e$ arasındaki alan nedir?

   a) 4

   b) 2

   c) 2.5

   d) 1.5

   (e) 1

7. $y=2x2+3x-1$ ve $y=x^2-3$ eğrileri arasındaki alan nedir?

   (a) 1/6

   b) 2/3

   c) 5/6

   d) 2/5

   e) 1/3

8. $y=x-3$ ve $y=2x+5$ doğruları ile x-ekseni arasındaki bölgenin alanı nedir?

   a) 12

   b) 16

   (c) 32

   d) 25

   e) 30

9. y=x+2 fonksiyonunun x=0, x=3 doğrularıyla sınırlı bölgenin $\overrightarrow{OX}$ ekseni etrafında döndürülmesiyle oluşan geometrik şeklin hacmi aşağıdakilerden hangisidir?

(a) $\pi\left(\frac{x^3}{3}+x^2+x\right)\Big|_0^3$

b) $\pi\left(\frac{x^2}{2}+x+1\right)\Big|_0^3$

c) $\pi\left(x^3+\frac{x^3}{2}+x\right)\Big|_0^3$

d) $\pi\left(\frac{x^3}{6}+x^2+2x\right)\Big|_0^3$

e) $\pi(x^2+2x+1)\Big|_0^3$

10. y=Sin 2x eğrisinin bir periyodunun x ekseni etrafında döndürülmesiyle oluşan hacim aşağıdakilerden hangisidir?

(a) $\frac{\pi^2}{2}$

b) $\frac{\pi^2}{4}$

c) π^2

d) $2\pi^2$

e) $4\pi^2$

11. $y=2x^2$ eğrisi $y=0$ ve $y=8$ doğruları ve y ekseni ile sınırlanan bölgenin y ekseni etrafında döndürülmesinden meydana gelen dönel cismin hacmi aşağıdakilerden hangisidir?

(a) $\pi\left(\frac{y^2}{4}\right)\Big|_0^8$

b) $2\pi\left(\frac{y^3}{12}\right)\Big|_0^8$

c) $2\pi\left(\frac{2y}{4}\right)\Big|_0^8$

d) $2\pi\left(\frac{\pi^2y^2}{4}\right)\Big|_0^8$

e) $2y\pi^2\Big|_0^8$

12. $y=x^4$ eğrisi $y=0$, $y=4$ doğruları ve y - ekseni arasında kalan alan y - ekseni etrafında döndürülüyor. Oluşan cismin hacmi kaç br^3 dür?

a) $7/3\pi$

b) $10/3\pi$

(c) $16/3\pi$

d) $19/3\pi$

e) $22/3\pi$

I. ÖĞRENME BİRİMİ: İNTEGRAL KAVRAMININ BELİRLENMESİ VE İNTEGRAL ALMA YÖNTEMLERİ

İZLEME TESTI I B

1. $f(x)=e^{x}+1$ fonksiyonunun sınırı aşağıdakilerden hangisidir?

   a) Alttan sınırı 2

   b) Üstten sınırı 1

   c) Üstten sınırı 2

   d) Sınırsızdır

   (e) Alttan sınırı 1

2. $f(x)= -3|x|-1$ fonksiyonunun sınırı aşağıdakilerden hangisidir?

   a) Üstten sınırı -4

   (b) Üstten sınırı -1

   c) Alttan sınırı -1

   d) Alttan sınırı -4

   e) Sınırsızdır

3. $f(x)= |2.\sin x-1|$ fonksiyonunun sınırları aşağıdakilerden hangisidir?

   a) Üstten sınırı -1, alttan sınırı -3

   (b) Üstten sınırı 3, alttan sınırı 1

   c) Üstten sınırı 1, alttan sınırı -3

   d) Üstten sınırı 3, alttan sınırı -1

   e) Üstten sınırı ve alttan sınırsız

4. $\int_a^b f(x)dx = F(x)\Big|_a^b$ ise aşağıdaki matematiksel ifadelerden hangisi doğrudur?

a) F(a).F(b)

(b) F(b)-F(a)

c) F(a)-F(b)

d) F(a-b)

e) F(b-a)

5. Aşağıdaki fonksiyonlardan hangisinin [-1,1] aralığında integrali alınabilir?

a) $f(x) = \dfrac{1}{x-1}$

b) $f(x) = \dfrac{x-1}{x+1}$

c) $f(x) = tg\ \dfrac{\pi x}{2}$

(d) $f(x) = \dfrac{x}{x-2}$

e) $f(x) = \dfrac{1}{x}$

6. Aşağıdaki fonksiyonlardan hangisinin integrali vardır?

(a) $\int_0^{3\pi/4} tanx.dx$

b) $\int_0^{\pi/2} Cotx.dx$

c) $\int_0^{10} logx.dx$

d) $\int_0^{\pi/2} Cosecx$

e) $\int_0^1 \dfrac{1}{3x^2+2x-5}$

7. $\int_a^b [3f(x)+g(x)]dx=10$ $\int_a^b g(x)dx=1$ ise $\int_a^b f(x)dx$ kaçtır?

a) 1

b) 2

(c) 3

d) 4

e) 5

8. Aşağıdaki matematiksel ifadelerden hangisi doğrudur?

(a) $\int (3\sin x+6)dx=3\int (\sin x+2)dx$

b) $\int \frac{1}{3x^2+2x)}dx=\frac{1}{3}\int \frac{1}{x^2+2x}dx$

c) $\int \cos^2 x.\sin 3x dx=3\int \cos^2 x.\sin x dx$

d) $\int \ln 6x.dx=6\int \ln x.dx$

e) $\int \frac{(7x^2+8)}{5}dx=\frac{7}{5}\int (x^2+8).dx$

9. $\int_a^c f(x)dx=0$ ise c aşağıdakilerden hangisine eşittir?

(a) a

b) b

c) $\frac{ab}{2}$

d) $\frac{a+b}{2}$

e) $\frac{b-a}{2}$

10. $\int_0^5 (9x^2+2x)dx$ ifadesinin eşiti nedir?

a) 210

b) 0

(c) 400

d) 160

e) 200

11. f(x) $\int_2^{x^3} e^t dt$ ise $f'(x)$ aşağıdakilerden hangisidir?

a) e^x-e^2

b) $e^{x^3}-e^2$

c) $x^3.e^{x^3}$

(d) $3x^2.e^{x^3}$

e) $3x^2.e^{3x^2}$

12. $f'(x)=3x^2+2x+1$ ve $f(1)=7$ olduğuna göre $f(0)$ aşağıdakilerden hangisidir?

(a) 4

b) -2

c) 3

d) -5

e) 1

13. $\int_{-1}^{3} (x^2-2x+5)dx$ ifadesinin eşiti nedir?

(a) $\frac{64}{3}$

b) $\frac{64}{5}$

c) $\frac{16}{3}$

d) $\frac{32}{3}$

e) $\frac{16}{5}$

14. $\int Sin\ 5x dx$ eşiti nedir?

a) $\frac{1}{5} Sin5x+c$

b) $\frac{-1}{5} Sin5x+c$

c) $\frac{1}{5} Cos5x+c$

(d) $\frac{-1}{5} Cos5x$

e) $\frac{1}{5} tan5x$

15. $\int e^{3x^2+x}(6x+1)dx$ ifadesinin eşiti nedir?

a) $\ln|x^2+x| + c$

b) $-\ln|3x^2+x| + c$

c) $\ln|6x+1| + c$

d) $-e^{(3x^2+x)} + c$

(e) $e^{(3x^2+x)} + c$

16. $\int x.\ln x dx$ ifadesinin eşiti nedir?

a) $\frac{-x^2\ln x}{2} - \frac{x^2}{4} + c$

(b) $\frac{x^2\ln x}{2} - \frac{x^2}{4} + c$

c) $\frac{x^2\ln x}{2} + \frac{x^2}{4} + c$

d) $x^2\ln x - \frac{x^2}{2} + c$

e) $-x^2\ln x - \frac{x^2}{2} + c$

17. $\int \frac{dx}{x^2(x-1)}$ ifadesinin eşiti nedir?

a) $\ln|x-1| + 1/x + c$

b) $\ln|x(x-1)| + x + c$

c) $\ln|x(x-1)| + 1/x + c$ d) $\ln|x^2-1| + 1/x + c$

(e) $\ln\left|\frac{x-1}{x}\right| + \frac{1}{x} + c$

18. $\int \frac{Sinx}{1+2Cosx+Cos^2x)}\,dx$ ifadesinin eşiti aşağıdakilerden hangisidir?

a) $\frac{1}{1+Cosx}$

b) $\frac{1}{1+Sinx}$

(c) $-\frac{1}{1+Cosx}$

d) $-\frac{1}{1+Sinx}$

e) $\frac{1}{1+tanx}$

19. $\int \frac{Sin\ 2x}{1+Sin^2x}\,dx$ ifadesinin eşiti aşağıdakilerden hangisidir?

(a) $ln\ |1+Sin^2x|\ +c$

b) $-ln\ |\ 1+Sin^2x|\ +c$

c) $ln|\ 1+Cos^2x|\ +c$

d) $-ln|\ 1+Cos^2x|\ +c$

e) $ln\ |1-Sin^2x|\ +c$

II ÖĞRENME BİRİMİ: ÖZEL FONKSİYONLARIN İNTEGRALİ

İZLEME TESTİ II B

1. $\int_0^2 |x-1|dx$ ifadesinin değeri aşağıdakilerden hangisidir?

   a) -1

   (b) 1

   c) -1/2

   d) 2

   e) -2

2. $\int_0^2 |x^2-1|dx$ ifadesinin değeri aşağıdakilerden hangisidir?

   a) -2

   (b) 2

   c) -1

   d) 1

   e) 0

3. $\int_{-2}^4 |x+1|dx$ ifadesinin değeri aşağıdakilerden hangisidir?

   a) -13

   b) -4

   (c) 13

   d) 6

   e) 4

4. $\int_{-1}^{1} [\![2x]\!] dx$ ifadesinin değeri aşağıdakilerden hangisidir?

(a) -1

b) 0

c) 1

d) 2

e) 3

5. $\int_{0}^{2\pi} [\![\cos x]\!] . \cos x \, dx$ ifadesinin değeri aşağıdakilerden hangisidir?

a) 0

b) 1

(c) 2

d) 3

e) 4

6. $a \in Z$ olmak üzere $\int_{1}^{3} [\![x+a]\!] \, dx = 13$ ise a'nın değeri aşağıdakilerden hangisidir?

a) 1

b) 2

c) 3

d) 4

(e) 5

7. $\int_{-1}^{4} Sgn(x^2-3x+2)\,dx$ ifadesinin değeri aşağıdakilerden hangisidir?

a) 2

b) 4

c) 2.5

d) 5

(e) 3

8. $\int_{2}^{4} Sgn(-x^2+4x)\,dx$ ifadesinin değeri aşağıdakilerden hangisidir?

a) −2

b) 2

c) 1

(d) −1

e) 0

9. $\int_{-4}^{2} Sgn(2x+4)\,dx$ ifadesinin değeri aşağıdakilerden hangisidir?

a) 0.5

b) −1

(c) 2

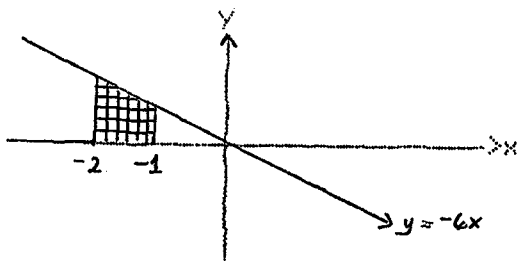
d) 1

e) 3

III ÖĞRENME BİRİMİ: ALAN VE HACİM HESAPLARI

İZLEME TESTİ III B

1.



Şekildeki taralı alanın sonucu aşağıdakilerden hangisidir?

a) 6

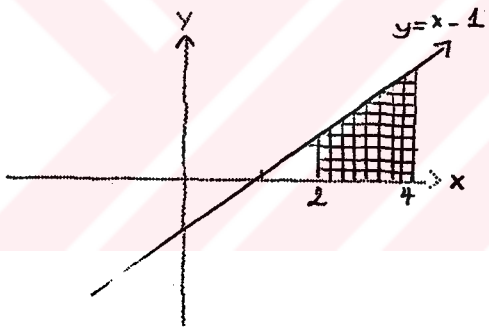
b) 7

c) 8

(d) 9

e) 12

2.



Şekildeki taralı alanın sonucu aşağıdakilerden hangisidir?

(a) 4

b) 6

c) 7

d) 8

e) 10

3. $y=4x$, $x=2$ doğruları ile x - ekseni arasında kalan alan aşağıdakilerden hangisidir?

   a) 2

   b) 4

   c) 6

   (d) 8

   e) 10

4. $y=x^2-1$ ile x ekseninin sınırladığı alan nedir?

   a) 1/3

   b) 7/3

   (c) 4/3

   d) 2/3

   e) 5/3

5. $y=x^2-1$, $y=0$ (x ekseni) $x=2$, $x=3$ arasındaki bölgenin alanı aşağıdakilerden hangisidir?

   a) 3/8

   b) 5/4

   c) 8/3

   d) 6/7

   (e) 16/3

6. $y=e^{3x}$, $y=0$, $x=0$, $x=4$ arasındaki alan aşağıdakilerden hangisidir?

(a) $\dfrac{4}{\ln 2}$

b) $(\ln 2)^2$

c) $\dfrac{1}{\ln 2}$

d) $\ln 2$

e) $\dfrac{\ln 5}{3}$

7. $y=x^3$, $y=x^2$ arasındaki alan nedir?

a) 3/4

b) 2/5

c) 3/5

(d) 1/12

e) 1/4

8. $y=2x+3$, $y=-x$ doğruları ile x - ekseni arasında kalan alan aşağıdakilerden hangisidir?

(a) 3/4

b) 1/2

c) 1/4

d) 1

e) 5/4

9. $y=x^2-4$ fonksiyonun, $\overrightarrow{OX}$ ile sınırlı bölgenin x ekseni etrafında döndürülmesiyle oluşan hacim aşağıdakilerden hangisidir?

a) $\pi \int_{-2}^{2} (4x^3-16x+16)\ dx$

(b) $\pi \int_{-2}^{2} (x^4-8x^2+16)\ dx$

c) $\pi \int_{0}^{2} (x^4-8x^2+16)\ dx$

d) $\pi \int_{-2}^{0} (x^4-8x^2+16)\ dx$

e) $\pi \int_{-1}^{1} (x^4-8x^2+16)\ dx$

10. $y=x^2$ parabolü $x=1$, $x=2$ doğruları ve x - ekseni arasında kalan alan x - ekseni etrafında döndürülüyor. Oluşan cismin hacmi kaç br^3 dür?

a) 16π

b) $\frac{17\pi}{3}$

(c) $\frac{31\pi}{5}$

d) 8π

e) $\frac{21\pi}{4}$

11. $y=x^2-2$ eğrisi $y=0$ $y=6$ doğruları ve y ekseni ile sınırlanan bölgenin y - ekseni etrafında döndürülmesiyle meydana gelen cismin hacmi aşağıdakilerden hangisidir?

(a) $\pi\left(\frac{y^2}{2}+2y\right)\Big|_0^6$

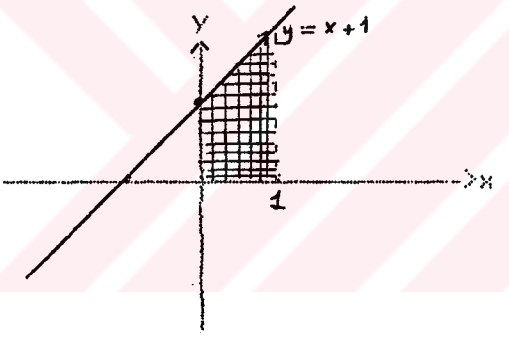
b) $\frac{\pi y^3}{4}\Big|_0^6$

c) $2\pi^2y^2\Big|_0^6$

d) $3\pi^3y\Big|_0^6$

e) $\pi\left(\frac{y^2}{4}+y\right)\Big|_0^6$

12.



Şekildeki taralı alan y - ekseni etrafında döndürüldüğünde oluşan cismin hacmi kaç br^3 dür?

a) $\frac{2\pi}{3}$

b) π

c) $\frac{4\pi}{3}$

(d) $\frac{5\pi}{3}$

e) 2π

I. ÖĞRENME BİRİMİ: İNTEGRAL KAVRAMININ BELİRLENMESİ VE İNTEGRAL ALMA YÖNTEMLERİ

İZLEME TESTİ I C

1. $f(x)=x^2$ fonksiyonunun sınırı aşağıdakilerden hangisidir?

   a) Alttan sınırı 1

   b) Üstten sınırı 1

   c) Alttan sınırı 0

   d) Üstten sınırı -1

   (e) Alttan sınırı -1

2. $f(x)=3+2x-x^2$ fonksiyonunun sınırı aşağıdakilerden hangisidir?

   (a) Üstten sınırı 4

   b) Alttan sınırı 4

   c) Üstten sınırı -2

   d) Alttan sınırı -2

   e) Üstten sınırı 2

3. $x\neq 0$ olmak üzere $f(x)=\ln \frac{1}{x^2}$ fonksiyonunun sınırları aşağıdakilerden hangisidir?

   a) Alttan sınırı 0, üstten sınırı e

   b) Alttan sınırı 1, üstten sınırı e

   (c) Alttan sınırı 0, üstten sınırı 1

   d) Alttan sınırı -1, üstten sınırı 1

   e) Alttan sınırı -1, üstten sınırı 0

4. $\int_a^b f(x)dx = F(x)\Big|_a^b$ integralinin sonucu 3 ise, aşağıdakilerden hangisi doğrudur?

a) $F(b) = \dfrac{3}{F(a)}$

b) $F(b)=3.F(a)$

c) $F(b)=3-F(a)$

(d) $F(b)=3+F(a)$

e) $F(b-a)=3$

5. Aşağıdaki fonksiyonlardan hangisinin [-2,2] aralığında integrali alınabilir?

a) $f(x)=\text{Cosec}\pi x$

b) $f(x) = \dfrac{1}{x^2-1}$

c) $f(x)=\ln(x+2)$

d) $f(x)=\text{Cot}x$

(e) $f(x) = \dfrac{1}{x^2+6x+9}$

6. Aşağıdaki fonksiyonlardan hangisinin integrali vardır?

(a) $\int_0^{\pi/2} \tan\dfrac{x}{2}\,dx$

b) $\int_{-\pi/2}^{\pi/2} \text{Cot}(x-\pi/2)$

c) $\int_{-1}^{1} (1)/\ (1x^2-2x+1)dx$

d) $\int_{3\pi}^{4\pi} \text{Sec}(x)/(2)dx$

e) $\int_{-3}^{-1} (1)/\ \ln(x+2)$

7. $\int_a^b f(x)dx=4$ $\int_a^b g(x)dx=3$ ise $\int_a^b [2f(x)-3g(x)]dx$ kaçtır?

a) (a-b)

b) 2a-3b

c) 1

(d) -1

e) 0

8. Aşağıdaki matematiksel ifadelerden hangisi doğrudur?

a) $\int \frac{2(x^2-2x+1)}{3x+1}dx = \frac{2}{3}\int \frac{(x-1)^2}{x+1}dx$

b) $\int \frac{3x+6}{12x^2-3x+6}dx = 3\int \frac{x+2}{4x^2-x+2}dx$

c) $\int \frac{x^2+2x+1}{2x+3}dx = \frac{1}{2}\int \frac{(x+1)^2}{x+3}dx$

d) $2\int \frac{x+2}{x^2+8x+1}dx = \int \frac{2x+4}{2x^2+16x+2}dx$

(e) $\int \frac{2x+4}{3x^2-12}dx = \frac{2}{3}\int \frac{dx}{x-2}$

9. $f(x)=3x^2+4x$ $g(x)=x^2-8x$ olduğuna göre $\int_{f(7)}^{g(7)} [f(x)+g(x)]dx$ integralinin sonucu aşağıdakilerden hangisidir?

a) -4

b) -2

(c) 0

d) 2

e) 4

10. $\int_{-1}^{2} (x-1)^2\,dx$ integralinin sonucu aşağıdakilerden hangisidir?

a) $\frac{1}{3}$

(b) 1

c) 0

d) -1

e) $\frac{-1}{3}$

11. $f(x)=\int_{0}^{\cos x} (2-6t^2)dt$ ise $f(x)$ aşağıdakilerden hangisidir?

(a) Sin 2x

b) Sin x

c) $\cos^2 x$

d) $\sin^2 x$

e) Cosx

12. $f^1(x)=e^x$ ve $f(0)=1$ ise $f(1)$ aşağıdakilerden hangisidir?

a) e^2

(b) e

c) 0

d) $\frac{1}{e}$

e) $\frac{1}{e^2}$

13. $\int_1^2 (2x-1)dx$ ifadesinin eşiti aşağıdakilerden hangisidir?

a) -1

b) 0

c) 1

(d) 2

e) 3

14. $\int (1+\tan^2 x)dx$ ifadesinin eşiti aşağıdakilerden hangisidir?

a) Secx

b) Cotx

(c) Tanx

d) Tan^2

e) Sin^2x

15. $\int \frac{Sin2x}{1+Sin^2x} dx$ ifadesinin eşiti aşağıdakilerden hangisidir?

(a) $2-Cos^2x$

b) Sin^2x

c) Sin2x

d) $1+Cos^2x$

e) $1tan^2x$

16. $\int lnx\ dx$ ifadesinin eşiti aşağıdakilerden hangisidir?

a) lnx+x

b) xlnx

c) lnx-x

d) xlnx+x

(e) xlnx-x

17. $\int \frac{2x+1}{x^2-3x+2}\,dx$ ifadesinin eşiti aşağıdakilerden hangisidir?

(a) $5\ln|x-2| - 3\ln|x-1|$

b) $3\ln|x-2| - 5\ln|x-1|$

c) $5\ln|x-2| + 3\ln|x-1|$

d) $3\ln|x-2| + 5\ln|x-1|$

e) $3\ln|x+2| - 5\ln|x+1|$

18. $\int \frac{1+\tan^4 x}{2-\sec^2 x}\,dx$ ifadesinin eşiti aşağıdakilerden hangisidir?

a) $1+\tan 2x$

(b) $\tan x$

c) $\tan^2 x$

d) $\cot x$

e) $\cot^2 x$

19. $\int \frac{x^2+2x}{x^3+3x^2-1}\,dx$ ifadesinin eşiti aşağıdakilerden hangisidir?

a) $3\sqrt{x^3+3x^2-1}$

(b) $3\ln|x^3+3x^2-1|$

c) $\ln|x^3+2x^2|$

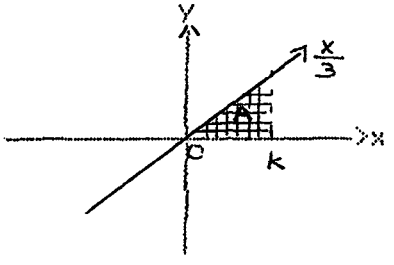
d) $\frac{3}{x^3+3x^2-1}$

e) $\ln|3x^2+6x|$

III. ÖĞRENME BİRİMİ: ALAN VE HACİM HESAPLARI

İZLEME TESTI III C

1.



Şekildeki taralı alanın sonucu A=24 br² olduğuna göre "k" aşağıdakilerden hangisidir?

a) 8

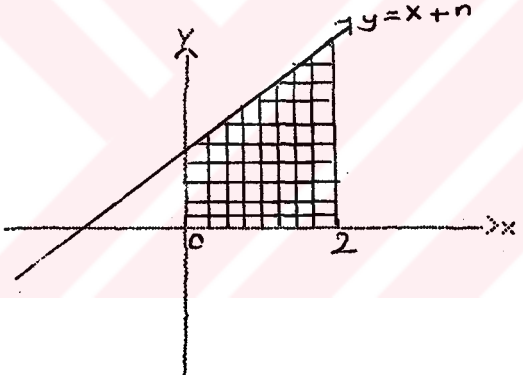
b) 9

(c) 12

d) 16

e) 62

2.



Şekildeki taralı alan n^2+n olarak verildiğine göre n'in çözüm kümesi aşağıdakilerden hangisidir?

(a) {-1,2}

b) {1,-2}

c) {-1,1}

d) {-2,2}

e) {-2,1}

3. $y = \frac{3}{2}x+3$ denkleminin x- eksenini kestiği nokta ile x=2 doğrusu arasında kalan alan aşağıdakilerden hangisidir?

a) 6

b) 8

c) 4

d) 2

(e) 12

4. $y=-x^2+2x$ eğrisi ile x ekseni arasında kalan bölgenin alanı aşağıdakilerden hangisidir?

a) 3/4

b) 1/2

(c) 4/3

d) 1/3

e) 4

5. $y=x^2-x$ ve $y=x+1$ eğrileri ile y ekseni ve x=2 doğrusu ile sınırlı bölgenin alanı aşağıdakilerden hangisidir?

a) 1/3

b) 3/7

(c) 10/3

d) 9/2

e) 3

6. y=Cos2x fonksiyonu ile x=0 ve x=π/3 arasında kalan bölgenin alanı aşağıdakilerden hangisidir?

a) $\frac{1}{4}$

b) $\frac{1}{2}$

c) $\frac{\sqrt{3}}{2}$

(d) $\frac{\sqrt{3}}{4}$

e) 1

7. $y=-x^2+4x+8$ ve $y=x^2-2x$ eğrileri arasında kalan bölgenin alanı aşağıdakilerden hangisidir?

a) $21\frac{2}{3}$

b) 57

c) $37\frac{2}{3}$

(d) $41\frac{2}{3}$

e) 61

8. y=2x+1, y=-3x+2 ve x- ekseni arasında kalan alan aşağıdakilerden hangisidir?

a) 5/50

(b) 7/60

c) 4/60

d) 4/30

e) 10/60

9. $y=3x+1$ doğrusunun $x=-1/3$ ve $x=3$ doğrularıyla sınırlı bölgenin $\vec{ox}$ ekseni etrafında döndürülmesiyle oluşan geometrik şekilin hacim ifadesi aşağıdakilerden hangisidir?

a) $\pi(9x^2+4+1)\Big|_{-1/3}^{3}$

b) $\pi\left(3x^3+\frac{3}{2}x^2+1\right)\Big|_{-1/3}^{3}$

c) $\pi\left(\frac{x^3}{3}+\frac{3}{2}x^2+x\right)\Big|_{-1/3}^{3}$

d) $\pi(x^3+3x^2+1)\Big|_{-1/3}^{3}$

(e) $\pi(3x^3+3x^2+x)\Big|_{-1/3}^{3}$

10. $y=\sqrt{e^x}$ eğrisinin y- eksenini kestiği nokta ile $x=2$ doğrusu arasında sınırlı bölgenin x- ekseni etrafında döndürülmesiyle oluşan şeklin hacmi aşağıdakilerden hangisidir?

a) πe

b) πe^2

(c) $\pi(e-1)$

d) $\pi(e^2-1)$

e) $\pi(e^2-e)$

11. $y=3x^2$ eğrisi $y=0$ ve $y=2$ doğruları ve y ekseni ile sınırlanan bölgenin y ekseni etrafında döndürülmesiyle meydana gelen dönel cismin hacmi aşağıdakilerden hangisidir?

(a) $\pi \dfrac{y^2}{6}\Big|_0^2$

b) $\dfrac{\pi y^2}{3}\Big|_0^2$

c) $\dfrac{\pi y^2}{6}\Big|_0^2$

d) $\dfrac{\pi y}{3}\Big|_0^2$

e) $\dfrac{\pi y^3}{6}\Big|_0^2$

12. $y=\text{Arccos}x$ eğrisi $x=0$ ve $x=1$ doğruları ve x ekseni ile sınırlı bölgenin y ekseni etrafında döndürülmesi ile oluşan şeklin hacmi aşağıdakilerden hangisidir?

a) $1+\left(\dfrac{\pi}{2}\right).\pi$

b) $\left(\dfrac{1+\pi}{2}\right).\pi$

c) $\dfrac{1+\pi}{4}$

(d) $1+\left(\dfrac{\pi}{4}\right).\pi$

e) $-1+\left(\dfrac{\pi}{2}\right).\pi$

LEARNING UNIT: LINEAR ALGEBRA

IV. ÖĞRENME BİRİMİ: MATRİSLER

İZLEME TESTİ IV A

1. $\begin{bmatrix} -1 & 3 & 0 & 2 & -2 \\ 2 & -1 & 2 & 1 & 1 \\ 0 & 0 & -3 & 4 & 2 \\ 1 & 4 & 4 & -1 & -1 \end{bmatrix}$ Şeklinde verilen A Matrisinde a_{3x2} aşağıdakilerden hangisine eşittir?

a) -1

b) 2

c) -3

d) 4

(e) 0

2. Matrislerin özellikleri ile ilgili aşağıdaki ifadelerden hangisi doğrudur?

a) $(A+B)^d=A+B$

b) Asal köşegen üzerindeki elemanlar $a_{i,j}$ biçimindedir.

(c) $A_{3\times2}+B_{3\times2}=C_{3\times2}$

d) $A^2=2.A$ dir. (Bir matrisin karesi, kendisinin 2 katına eşittir.)

e) mnx tipi bir matriste m+n tane eleman vardır.

3. $\begin{bmatrix} x & a-b \\ x+y & a \end{bmatrix} = \begin{bmatrix} 4 & -3 \\ 6 & -1 \end{bmatrix}$ (a,b,x,y) değerleri sıra ile aşağıdakilerden hangisine eşittir?

(a) (-1,2,4,2)

b) (2,-1,4,2)

c) (4,2,-1,2)

d) (2,2,-1,4)

e) (6,-3,4,-1)

4. $A=\begin{bmatrix}-1 & -2 & 3\\ 2 & 1 & 0\end{bmatrix}$ matrisinin transpozesi aşağıdakilerden hangisidir?

a) $A^t=\begin{bmatrix}3 & -2 & -1\\ 0 & 1 & 0\end{bmatrix}$

b) $A^t=\begin{bmatrix}-1 & -2 & 3\\ -2 & -1 & 3\end{bmatrix}$

(c) $A^t=\begin{bmatrix}-1 & 2\\ -2 & 1\\ 3 & 0\end{bmatrix}$

d) $A^t=\begin{bmatrix}2 & -1\\ 1 & -2\\ 0 & 3\end{bmatrix}$

e) $A^t=\begin{bmatrix}2 & 1\\ 1 & 2\\ 0 & -3\end{bmatrix}$

5. $A=\begin{bmatrix}2 & 0\\ 1 & 0\\ 2 & 3\end{bmatrix}$ matrisinin transpozesinin transpozesi aşağıdakilerden hangisidir?

a) $A=\begin{bmatrix}2 & 1 & 2\\ 0 & 0 & 3\end{bmatrix}$

b) $A=\begin{bmatrix}0 & 0 & 3\\ 2 & 1 & 2\end{bmatrix}$

c) $A=\begin{bmatrix}0 & 2\\ 0 & 1\\ 3 & 2\end{bmatrix}$

(d) $A=\begin{bmatrix}2 & 0\\ 1 & 0\\ 2 & 3\end{bmatrix}$

e) $A=\begin{bmatrix}-2 & 0\\ -1 & 0\\ -2 & -3\end{bmatrix}$

6. Aşağıdakilerden hangisi simetrik bir matristir?

(a) $\begin{bmatrix} 1 & 6 & 0 \\ 6 & 2 & 4 \\ 0 & 4 & -1 \end{bmatrix}$

b) $\begin{bmatrix} 3 & 0 & 5 \\ 5 & -3 & 2 \\ 0 & 2 & 3 \end{bmatrix}$

c) $\begin{bmatrix} 1 & 2 & 0 \\ 2 & 1 & -3 \\ 0 & 3 & 1 \end{bmatrix}$

d) $\begin{bmatrix} -1 & 7 & 3 \\ 7 & 2 & 12 \\ -2 & 12 & 1 \end{bmatrix}$

e) $\begin{bmatrix} 1 & -2 & 7 \\ 2 & 0 & 1 \\ -7 & -1 & 1 \end{bmatrix}$

7. Aşağıdakilerden hangisi antisimetrik matrisdir?

a) $\begin{bmatrix} 1 & 3 & -2 \\ 4 & 3 & 2 \\ 6 & -5 & 1 \end{bmatrix}$

b) $\begin{vmatrix} 2 & 6 & 3 \\ 1 & -2 & -6 \\ 3 & -1 & 2 \end{vmatrix}$

c) $\begin{bmatrix} 0 & -1 & 0 \\ -1 & 0 & -1 \\ 0 & -1 & -1 \end{bmatrix}$

(d) $\begin{bmatrix} 0 & 1 & -3 \\ -1 & 0 & -6 \\ 3 & 6 & 0 \end{bmatrix}$

e) $\begin{bmatrix} -2 & 2 & -2 \\ 2 & 2 & 2 \\ -2 & -2 & -2 \end{bmatrix}$

8. Aşağıdakilerden hangisi köşegen bir matristir?

a) $\begin{bmatrix} 0 & 1 & 1 \\ 2 & 0 & 2 \\ 3 & 3 & 0 \end{bmatrix}$

(b) $\begin{bmatrix} -1 & 0 & 0 \\ 0 & 2 & 0 \\ 0 & 0 & 3 \end{bmatrix}$

c) $\begin{bmatrix} 3 & 0 & 1 \\ 0 & 3 & 0 \\ 1 & 0 & 3 \end{bmatrix}$

d) $\begin{bmatrix} 0 & 1 & 0 \\ 1 & 0 & 0 \\ 0 & 0 & 1 \end{bmatrix}$

e) $\begin{bmatrix} 1 & 2 & 1 \\ 3 & 1 & 3 \\ 2 & 2 & 1 \end{bmatrix}$

9. $A=\begin{bmatrix} 1 & -3 & 4 \\ -2 & -1/2 & 3/2 \end{bmatrix}$ matrisinin negatifi aşağıdakilerden hangisine eşittir?

(a) $\begin{bmatrix} -1 & 3 & -4 \\ 2 & 1/2 & -3/2 \end{bmatrix}$

b) $\begin{bmatrix} -1 & -3 & -4 \\ 2 & 1/2 & -3/2 \end{bmatrix}$

c) $\begin{bmatrix} -1 & -3 & -4 \\ -2 & -1/2 & -3/2 \end{bmatrix}$

d) $\begin{bmatrix} 1 & 3 & 4 \\ 2 & 1/2 & 3/2 \end{bmatrix}$

e) $\begin{bmatrix} -1 & 3 & -4 \\ 2 & -1/2 & 3/2 \end{bmatrix}$

10. Matrislerin toplanmasıyla ilgili aşağıdaki ifadelerden hangisi doğrudur?

a) $(A+B)^d=A.d+B.d$

b) $A+A^{-1}=0$

c) $A+A=0$

d) $A+A^{-1}=0$

(e) $A+(B+C)=(A+B)+C$

11. $\begin{bmatrix} 3 & -2 \\ 4 & 6 \end{bmatrix} + \begin{bmatrix} -2 & x^2 \\ y & -8 \end{bmatrix} = \begin{bmatrix} 1 & 2 \\ 7 & -2 \end{bmatrix}$

Yukarıdaki ifade'de "x" ve "y" aşağıdakilerden hangisi olmalıdır?

a) x=4, y=3

b) x=3, y=3

c) x=1, y= -3

d) x=2, y=2

(e) x=-2, y=3

12. $k.\begin{bmatrix} 3 & -1 \\ 4 & -2 \end{bmatrix} = \begin{bmatrix} x & -y \\ z & -4 \end{bmatrix}$ olduğuna göre (k,x,y,z) aşağıdakilerden sırası ile hangisine eşittir?

a) (-2,-6,2,-8)

b) (2,-6,-2,-8)

(c) (2,6,-2,8)

d) (-2,6,-2)

e) (1/2,6,-8)

13. $A=\begin{bmatrix} -3 & 1 & -1 \\ 2 & -2 & 0 \\ 4 & -1 & 1 \end{bmatrix}$, $B=\begin{bmatrix} 2 & -1 & -1 \\ 0 & 2 & 1 \\ -1 & -1 & -1 \end{bmatrix}$

ve k (A+B)'nin çözüm matrisinde $a_{13}=6$ olduğuna göre a_{31} aşağıdakilerden hangisine eşittir?

(a) 9

b) 8

c) 6

d) 1

e) -3

14. A matrisi 3x4 ve B matrisi 4x1'lik birer matris ise bunların çarpımları olan C matrisinin boyutları aşağıdakilerden hangisidir?

a) 12x4

b) 4x3

(c) 3x1

d) 3x4

e) 4x1

15. $A=\begin{bmatrix}1 & 2\\ 0 & 3\end{bmatrix}$ $B=\begin{bmatrix}1 & 0 & -1\\ 2 & 3 & -2\end{bmatrix}$ A.B=C matrisi aşağıdakilerden hangisine eşittir?

a) $\begin{bmatrix}6 & 9 & -6\\ 5 & 6 & -5\end{bmatrix}$

(b) $\begin{bmatrix}5 & 6 & -5\\ 6 & 9 & -6\end{bmatrix}$

c) $\begin{bmatrix}-5 & 6 & 5\\ -6 & 9 & -6\end{bmatrix}$

d) $\begin{bmatrix}9 & 6 & 5\\ 6 & -5 & 6\end{bmatrix}$

e) $\begin{bmatrix}6 & -5 & 6\\ 9 & -6 & 5\end{bmatrix}$

16. $A=\begin{bmatrix}8 & 4\\ 0 & 8\end{bmatrix}$, $C=\begin{bmatrix}4 & -2\\ 0 & 16\end{bmatrix}$ matrisleri veriliyor. A.B=C olacak şekilde B matrisi aşağıdakilerden hangisidir?

a) $\begin{bmatrix}2 & 2\\ 0 & 1/2\end{bmatrix}$

b) $\begin{bmatrix}32 & 8\\ 0 & 128\end{bmatrix}$

c) $\begin{bmatrix}1 & 1/2\\ 0 & 1/4\end{bmatrix}$

d) $\begin{bmatrix}1 & -3/4\\ 0 & 1/4\end{bmatrix}$

(e) $\begin{bmatrix}1/2 & -3/4\\ 0 & 2\end{bmatrix}$

17. $A=\begin{bmatrix}1 & 3\\ 4 & 2\end{bmatrix}$ ise A^2 aşağıdakilerden hangisine eşittir?

a) $A^2=\begin{bmatrix}9 & 12\\ 16 & 12\end{bmatrix}$

b) $A^2=\begin{bmatrix}1 & 9\\ 16 & 4\end{bmatrix}$

(c) $A^2=\begin{bmatrix}13 & 9\\ 12 & 16\end{bmatrix}$

d) $A^2\begin{bmatrix}10 & 10\\ 10 & 20\end{bmatrix}$

e) $A^2=\begin{bmatrix}10 & 10\\ 20 & 10\end{bmatrix}$

18. $x\begin{bmatrix}2\\ 3\end{bmatrix}+y\begin{bmatrix}6\\ -3\end{bmatrix}=\begin{bmatrix}6\\ 5\end{bmatrix}$ eşitliğini sağlayan x ve y değerleri sırasıyla aşağıdakilerden hangisidir?

(a) (2,1/3)

b) (2,3)

c) (3,2)

d) 3,1/4)

e) (4,1/5)

V ÖĞRENME BİRİMİ: DETERMİNANTLAR

İZLEME TESTI V A

1. $\begin{vmatrix} 3 & -2 \\ -3 & 4 \end{vmatrix}$ determinantının sonucu aşağıdakilerden hangisidir?

a) -2

b) 2

(c) 6

d) -6

e) 4

2. $\begin{vmatrix} 2x & 6 \\ 5 & x \end{vmatrix}$ = 2 ise x'in değeri aşağıdakilerden hangisidir?

a) ∓ 6

b) ∓ 5

(c) ∓ 4

d) ∓ 7

e) ∓ 3

3. $\begin{vmatrix} 1 & 3 & 2 \\ 2 & -1 & 4 \\ 5 & 2 & 3 \end{vmatrix}$ determinantının değeri aşağıdakilerden hangisidir?

(a) 49

b) 28

c) 63

d) -57

e) 55

4. $\begin{vmatrix} 2 & 3 & 1 \\ 0 & -1 & 4 \\ x & 6 & 2 \end{vmatrix} = 0$ ise x aşağıdakilerden hangisidir?

a) 8

b) 7

c) 6

d) 5

(e) 4

5. $\begin{vmatrix} x & 7 \\ 5 & 3 \end{vmatrix} = \begin{vmatrix} 4 & 1 \\ 3 & -2 \end{vmatrix}$ determinantlarının eşitliği verildiğine göre x aşağıdakilerden hangisidir?

a) 3

b) 5

c) 6

(d) 10

e) 12

6. $\begin{vmatrix} 4 & 2 & -3 \\ 2 & 5 & -1 \\ 2 & 4 & -8 \end{vmatrix}$ determinantında a_{32} elemanının kofaktörü aşağıdakilerden hangisidir?

(a) −8

b) 4

c) 5

d) −1

e) 2

7. $\begin{vmatrix} 2 & 3 & 4 \\ 5 & -6 & 9 \\ 1 & 3 & -5 \end{vmatrix}$ determinantında a_{33} elemanının minörü aşağıdakilerden hangisidir?

a) 1

b) 2

(c) 3

d) 4

e) 5

8. Aşağıdaki determinantlardan hangisinin değeri sıfıra eşittir?

a) $\begin{vmatrix} 2 & 2 & 1 \\ -2 & 3 & 0 \\ 1 & 2 & 4 \end{vmatrix}$

b) $\begin{vmatrix} 6 & 3 & 0 \\ 7 & 4 & 1 \\ 8 & 5 & 2 \end{vmatrix}$

c) $\begin{vmatrix} -1 & -2 & -3 \\ -4 & -5 & -6 \\ -7 & -8 & -9 \end{vmatrix}$

(d) $\begin{vmatrix} 1 & 4 & 4 \\ -2 & 3 & 3 \\ 7 & -1 & -1 \end{vmatrix}$

e) $\begin{vmatrix} -1 & 8 & 5 \\ 7 & -2 & 6 \\ 4 & 9 & -3 \end{vmatrix}$

9. Aşağıdaki determinantlardan hangisinin değeri sıfıra eşittir?

(a) $\begin{vmatrix} a_{11} & ka_{12} & a_{13} \\ a_{21} & ka_{22} & a_{23} \\ a_{31} & ka_{32} & a_{33} \end{vmatrix}$

b) $\begin{vmatrix} ka_{11} & a_{12} & a_{13} \\ a_{21} & ka_{22} & a_{23} \\ a_{31} & a_{32} & ka_{33} \end{vmatrix}$

c) $\begin{vmatrix} a_{11} & a_{12} & ka_{13} \\ a_{21} & ka_{22} & a_{23} \\ ka_{31} & a_{32} & a_{33} \end{vmatrix}$

d) $\begin{vmatrix} ka_{11} & a_{12} & a_{13} \\ ka_{21} & a_{22} & a_{23} \\ a_{31} & ka_{32} & a_{33} \end{vmatrix}$

e) $\begin{vmatrix} a_{11} & ka_{12} & ka_{13} \\ a_{21} & ka_{22} & a_{23} \\ a_{31} & a_{32} & a_{33} \end{vmatrix}$

10. Aşağıdaki determinantlardan hangisinin değeri sıfıra eşittir?

a) $\begin{vmatrix} a_{11} & 0 & 0 \\ a_{21} & a_{22} & a_{23} \\ a_{31} & a_{32} & a_{33} \end{vmatrix}$

b) $\begin{vmatrix} a_{11} & a_{12} & 0 \\ a_{21} & a_{22} & a_{23} \\ 0 & a_{32} & a_{33} \end{vmatrix}$

c) $\begin{vmatrix} a_{11} & a_{12} & a_{13} \\ 0 & a_{22} & 0 \\ a_{31} & a_{32} & a_{33} \end{vmatrix}$

(d) $\begin{vmatrix} a_{11} & a_{12} & 0 \\ a_{21} & a_{22} & 0 \\ a_{31} & a_{32} & 0 \end{vmatrix}$

e) $\begin{vmatrix} a_{11} & 0 & a_{13} \\ a_{21} & a_{22} & a_{13} \\ a_{31} & 0 & a_{33} \end{vmatrix}$

11. Bir determinantta bir satır veya sütun bir k∈R sayısı ile çarpıldığında yeni determinantın değeri için aşağıdakilerden hangisi söylenebilir?

a) İlk determinantın karesine eşittir.

(b) İlk determinantın k katına eşittir.

c) İlk determinantın k/3 katına eşittir.

d) İlk determinantın 3.k katına eşittir.

e) Değeri değişmez.

12. (1) $\begin{vmatrix} a_{11} & a_{12} & a_{13} \\ a_{21} & a_{22} & a_{23} \\ a_{31} & a_{32} & a_{33} \end{vmatrix}$ (2) $\begin{vmatrix} a_{11} & a_{12} & a_{13}+ & ka_{11} \\ a_{21} & a_{22} & a_{23}+ & ka_{21} \\ a_{31} & a_{32} & a_{33}+ & ka_{31} \end{vmatrix}$

Verilen (1) ve (2) nolu determinantlar için aşağıdakilerden hangisi doğrudur?

a) (2) nolu determinant (1) nolu determinantın k katıdır.

b) (2) nolu determinant sıfıra eşittir.

(c) (1) = (2)

d) Sayısal değer verilmediği için bu determinantlar hakkında birşey söylenemez.

e) (2) = 4/3.(1)

13. $A=\begin{bmatrix} 3 & 5 \\ 2 & 6 \end{bmatrix}$ matrisinin rangı aşağıdakilerden hangisidir?

a) Rang (A)=3

b) Rang (A)=1

c) Rang (A)=0

(d) Rang (A)=2

e) Rang (A)=4

14. $\begin{aligned} 2x + 3y + z &= 9 \\ x + 2y + 3z &= 6 \\ 2x + y + 2z &= 9 \end{aligned}$ (x,y,z) üçlüsü aşağıdakilerden hangisidir?

(a) $\frac{42}{11}, \frac{3}{11}, \frac{6}{11}$

b) $\frac{42}{14}, \frac{3}{14}, \frac{6}{14}$

c) $\frac{42}{9}, \frac{3}{9}, \frac{6}{9}$

d) $\frac{42}{12}, \frac{3}{12}, \frac{6}{12}$

e) $\frac{42}{19}, \frac{3}{19}, \frac{6}{19}$

IV ÖĞRENME BİRİMİ: MATRİSLER

İZLEME TESTİ IV B

1. $A=\begin{bmatrix} -1 & -1 & 2 \\ 1 & 0 & 3 \\ -4 & 7 & -1 \\ -2 & -3 & -5 \end{bmatrix}$ şeklinde verilen A matrisinde a23 aşağıdakilerden hangisidir?

   a) 7

   (b) 3

   c) -1

   d) 0

   e) -3

2. Aşağıdaki matrislerin özellikleriyle ilgili ifadelerden hangisi doğrudur?

   a) Bir satır matrisinin boyutu mxn dir.

   b) Asal köşegen üzerindeki elemanlar $a_{i,j}$ biçimindedir.

   c) $A^2 = A$ bir matrisinin karesi, kendisinin mutlak değerine eşittir.

   (d) $A_{3\times4}.B_{4\times6}=C_{3\times6}$ boyutundadır.

   e) mxn tipi bir matriste m+n tane eleman vardır.

3. $\begin{bmatrix} 1 & -4 \\ 0 & [x] \end{bmatrix}=\begin{bmatrix} 1 & -4 \\ 0 & [3x] \end{bmatrix}$ matris eşitliğinin olması için x ne olmalıdır?

   a) -1

   (b) [0,1/3)

   c) (0,1/3]

   d) [0,1/3]

   e) -2

4. $A=\begin{bmatrix} 1 & 2 & 2 \\ -1 & 2 & 0 \\ -7 & 3 & -2 \end{bmatrix}$ matrisinin devriği aşağıdakilerden hangisidir?

a) $A^t=\begin{bmatrix} -1 & -2 & -2 \\ 1 & -2 & 0 \\ 7 & -3 & 2 \end{bmatrix}$

b) $A^t=\begin{bmatrix} 2 & 2 & 1 \\ 0 & 2 & -1 \\ -2 & 3 & -7 \end{bmatrix}$

c) $A^t=\begin{bmatrix} -1 & -7 & 1 \\ 2 & 3 & 2 \\ 0 & -2 & 2 \end{bmatrix}$

d) $A^t=\begin{bmatrix} -1 & 1 & 7 \\ -2 & -2 & -3 \\ -2 & 0 & 2 \end{bmatrix}$

(e) $A^t=\begin{bmatrix} 1 & -1 & -7 \\ 2 & 2 & 3 \\ 2 & 0 & -2 \end{bmatrix}$

5. $A=\begin{bmatrix} 3 & 1 & -4 & 0 \\ 1 & -2 & -2 & 1 \end{bmatrix}$ matrisinin transpozesinin devriği aşağıdakilerden hangisidir?

(a) $A=\begin{bmatrix} 3 & 1 & -4 & 0 \\ 1 & -2 & -2 & 1 \end{bmatrix}$

b) $A=\begin{bmatrix} -3 & -1 \\ -1 & 2 \\ 4 & 2 \\ 0 & -1 \end{bmatrix}$

c) $A=\begin{bmatrix} 3 & 1 \\ 1 & -2 \\ -4 & -2 \\ 0 & 1 \end{bmatrix}$

d) $A=\begin{bmatrix} -3 & -1 & 4 & 0 \\ -1 & 2 & 2 & -1 \end{bmatrix}$

e) $A=\begin{bmatrix} 3 & -1 \\ 1 & 2 \\ -4 & 2 \\ 0 & -1 \end{bmatrix}$

6. $A=\begin{bmatrix} 2 & x & 1 \\ 0 & 3 & y \\ z & -2 & 4 \end{bmatrix}$ matrisi simetrik bir matristir. Buna göre (x,y,z) aşağıdakilerden hangisi olmalıdır?

a) (0,2,-1)

b) (-2,0,4)

c) (-2,-2,1)

d) (3,3,0)

(e) (0,-2,1)

7. $\begin{bmatrix} 0 & 1 & y \\ x & 0 & -6 \\ 3 & z & 0 \end{bmatrix}$ Bu matrisin bir antisimetrik matris olabilmesi için (x,y,z) üçlüsü sırasıyla aşağıdakilerden hangisi olmalıdır?

(a) (-1,-3,6)

b) (1,3,6)

c) (-1,-3,-3)

d) (-1,-3,-6)

e) (-1,3,-6)

8. $A=\begin{bmatrix} x & y & z \\ a & b & c \\ p & q & r \end{bmatrix}$ köşegen matrisi veriliyor. Aşağıdakilerden hangisi (hangileri) 0'a eşit olabilir?

a) x,z

b) x

(c) a,c

d) r

e) p,r

9. $A=\begin{bmatrix}-2 & -3\\ -4 & -5\end{bmatrix}$ $B=\begin{bmatrix}2 & y\\ x & t\end{bmatrix}$ B matrisi A matrisinin negatifi ise (x,y,t) üçlüsü aşağıdakilerden hangisidir?

a) (-4,3,-5)

b) (-4,-3,-5)

c) (5,4,3)

d) (3,4,5)

(e) (4,3,5)

10. Matrislerin toplamıyla ilgili aşağıdaki ifadelerden hangisi doğrudur?

a) Matrislerin toplanmasında toplanacak matrislerin aynı boyutlu olması gerekmez.

b) Matrisle tersinin toplamı sıfıra eşittir.

(c) $A_{3\times 2}+B_{3\times 2}= C_{3\times 2}$

d) Matrisler toplanırken köşegen üzerindeki elemanlar toplanmaz.

e) Bir matrisle negatifinin toplamı kendisinin iki katına eşittir.

11. $\begin{bmatrix}x & y\\ z & t\end{bmatrix} + \begin{bmatrix}-2 & 1\\ 0 & -3\end{bmatrix} = \begin{bmatrix}1 & 3\\ -1 & -4\end{bmatrix}$ olduğuna göre (x,y,z,t) aşağıdakilerden hangisine eşittir?

(a) (3,2,-1,-1)

b) (1,-4,1,1)

c) (-1,2,-1,1)

d) (3,-2,1,1)

e) (3,2,1,1)

12. $A=\begin{bmatrix}3 & 1\\ 8 & 4\end{bmatrix}$ matrisi veriliyor. Buna göre aşağıdakilerden hangisi doğrudur?

a) $A= 2\begin{bmatrix}3 & 1\\ 4 & 2\end{bmatrix}$

b) $A= 1/2\begin{bmatrix}6 & 2\\ 8 & 4\end{bmatrix}$

c) $A= 4\begin{bmatrix}3/4 & 1\\ 1 & 2\end{bmatrix}$

d) $A= 2\begin{bmatrix}6 & 2\\ 8 & 4\end{bmatrix}$

(e) $A= 1/2\begin{bmatrix}6 & 2\\ 16 & 8\end{bmatrix}$

13. $A=\begin{bmatrix}-1 & 2 & 1\\ 0 & -3 & 4\\ -6 & 0 & 3\end{bmatrix}$ matrisi ve k=2 veriliyor. k.(A+B)'nin çözümü birim matris olduğuna göre B aşağıdakilerden hangisidir?

a) $B=\begin{bmatrix}3 & -4 & -2\\ 0 & 7 & -8\\ 1 & 0 & -5\end{bmatrix}$

(b) $B=\begin{bmatrix}3/2 & -2 & -1\\ 0 & 7/2 & -4\\ 6 & 0 & -5/2\end{bmatrix}$

c) $B=\begin{bmatrix}3/2 & -4 & -2\\ 0 & 7/2 & -8\\ 12 & 0 & -5\end{bmatrix}$

d) $B=\begin{bmatrix}3 & -2 & -1\\ 0 & 7 & -4\\ 6 & 0 & -5\end{bmatrix}$

e) $B=\begin{bmatrix}3/2 & 2 & 1\\ 0 & 7/2 & 4\\ -6 & 0 & -5\end{bmatrix}$

14. $A_{m\times p} \cdot B_{p\times n} = C$ ..... eksik bırakılan yere aşağıdaki ifadelerden hangisi gelmelidir?

a) m×p

b) p×n

c) p×p

(d) m×n

e) m×m

15. $A=\begin{bmatrix} x & y \\ z & t \end{bmatrix}$ matrisi B (1,2) noktasını C (4,-6) noktasına dönüştürürse, aynı matris (5,10) noktasını hangi noktaya dönüştürür?

a) (2,-3)

b) (10,-20)

(c) (20,-30)

d) (30,-20)

e) (1,-2)

16. $A=\begin{bmatrix} 1 & -1 \\ 2 & 4 \end{bmatrix}$, $C=\begin{bmatrix} -6 & -5 \\ -18 & -1 \end{bmatrix}$ matrisleri veriliyor. $A^t.B=C$ olacak şekilde B matrisi aşağıdakilerden hangisidir?

a) $B=\begin{bmatrix} -2 & -3 \\ -4 & -1 \end{bmatrix}$

b) $B=\begin{bmatrix} 2 & 3 \\ 4 & 1 \end{bmatrix}$

c) $B=\begin{bmatrix} -2 & -3 \\ 4 & 1 \end{bmatrix}$

(d) $B=\begin{bmatrix} 2 & -3 \\ -4 & -1 \end{bmatrix}$

e) $B=\begin{bmatrix} 2 & -3 \\ 4 & -1 \end{bmatrix}$

17. $A=\begin{bmatrix} x & y \\ z & t \end{bmatrix}$ matrisinde her satırın terimleri toplamı 4 olduğuna göre A^2 matrisinin 2. satırındaki terimlerin toplamı aşağıdakilerden hangisine eşittir?

a) 4

b) 8

c) 12

(d) 16

e) 20

18. $x-3\begin{bmatrix} 2 & 5 \\ 1 & 6 \end{bmatrix} + 4 = 0$ denklemini sağlayan x matrisi aşağıdakilerden hangisidir?

a) $\begin{bmatrix} 1 & 4 \\ 1 & 5 \end{bmatrix}$

(b) $\begin{bmatrix} 2 & 15 \\ 3 & 14 \end{bmatrix}$

c) $\begin{bmatrix} 6 & 15 \\ 3 & 18 \end{bmatrix}$

d) $\begin{bmatrix} 4 & 0 \\ 3 & 4 \end{bmatrix}$

e) $\begin{bmatrix} 3 & -7 \\ 4 & 6 \end{bmatrix}$

V. ÖĞRENME BİRİMİ: DETERMİNANTLAR

İZLEME TESTİ V B

1. $\begin{vmatrix} \sin x & \cos x \\ -\cos x & \sin x \end{vmatrix}$ determinantının sonucu aşağıdakilerden hangisidir?

   a) $\sin^2 x$

   b) $\sin^2 x - \cos^2 x$

   c) $\cos^2 x$

   (d) 1

   e) 0

2. $\begin{vmatrix} 3 & 4 \\ 5 & |x| \end{vmatrix} = 1$ ise x'in değeri aşağıdakilerden hangisidir?

   a) {-7,3}

   b) {7}

   (c) {-7,7}

   d) {-7}

   e) {-3,3}

3. $\begin{vmatrix} 1 & y & yz \\ 0 & y-x & z(x-y) \\ 0 & z-x & y(x-z) \end{vmatrix}$ determinantının değeri aşağıdakilerden hangisidir?

   a) 0

   b) $(x^2-y^2)(x-y)$

   c) $(^2-x.z)(z-y)$

   d) 1

   (e) $(x-y)(x-z)(z-y)$

4. $\begin{vmatrix} x-2 & 4 & 3 \\ 1 & x+1 & -2 \\ 0 & 0 & x-4 \end{vmatrix} = 0$ Denkleminin çözüm kümesi aşağıdakilerden hangisidir?

(a) (4,3,-2)

b) (2,3,-4)

c) (-2,3,-4)

d) (4,-3,2)

e) (1,-2,3)

5. $\begin{vmatrix} 2x & -2 \\ 3x & 1 \end{vmatrix} = \begin{vmatrix} 4 & -2 \\ 2 & 1 \end{vmatrix}$ eşitliğinin olması için x ne olmalıdır?

a) 0

b) -2

c) 2

d) -1

(e) 1

6. $\begin{vmatrix} 1 & 2 & 0 \\ 4 & 3 & 2 \\ -5 & -1 & 4 \end{vmatrix}$ determinantının a_{23}'un kofaktörü aşağıdakilerden hangisidir?

a) -11

(b) 11

c) 10

d) 1

e) -10

7. $\begin{vmatrix} 4 & 2 & -3 \\ 2 & 5 & -1 \\ 2 & 4 & -8 \end{vmatrix}$ determinantında a_{33} elemanının minörü aşağıdakilerden hangisidir?

a) -12

b) -10

c) 10

d) 2

(e) 12

8. Aşağıdaki determinantlardan hangisinin değeri sıfıra eşittir?

(a) $\begin{vmatrix} 2 & 2 & 1 \\ 2 & 2 & 1 \\ 2 & 3 & 4 \end{vmatrix}$

b) $\begin{vmatrix} 2 & 1 & 2 \\ 2 & 1 & 3 \\ 1 & 2 & 1 \end{vmatrix}$

c) $\begin{vmatrix} -9 & -8 & -7 \\ -6 & -5 & -4 \\ -3 & -2 & -1 \end{vmatrix}$

d) $\begin{vmatrix} 1 & 2 & 2 \\ 2 & -1 & 2 \\ 2 & 2 & 1 \end{vmatrix}$

e) $\begin{vmatrix} -1 & 8 & 5 \\ 7 & -2 & 6 \\ 4 & 9 & -3 \end{vmatrix}$

9. Aşağıdaki determinantlardan hangisinin değeri sıfıra eşittir?

a) $\begin{vmatrix} 2 & 5 & 7 \\ 3 & 6 & 8 \\ 5 & 6 & 7 \end{vmatrix}$

(b) $\begin{vmatrix} 1 & 4 & 7 \\ 2 & 8 & 14 \\ -1 & 6 & 8 \end{vmatrix}$

c) $\begin{vmatrix} 3 & 4 & 5 \\ 6 & 7 & 8 \\ 9 & 0 & 1 \end{vmatrix}$

d) $\begin{vmatrix} -2 & -7 & -9 \\ 3 & -6 & 4 \\ 2 & 6 & 5 \end{vmatrix}$

e) $\begin{vmatrix} 1 & 2 & 1 \\ 1 & 3 & 1 \\ 2 & 4 & 5 \end{vmatrix}$

10. Aşağıdaki determinantlardan hangisinin değeri sıfıra eşittir?

a) $\begin{vmatrix} 9 & 2 & 3 \\ 5 & 7 & 6 \\ 3 & 2 & 1 \end{vmatrix}$

b) $\begin{vmatrix} 2 & 3 & 5 \\ -3 & -4 & -6 \\ 2 & 5 & 7 \end{vmatrix}$

(c) $\begin{vmatrix} 0 & 0 & 0 \\ 2 & 5 & 7 \\ 3 & 4 & 6 \end{vmatrix}$

d) $\begin{vmatrix} 3 & 2 & 1 \\ 6 & 5 & 4 \\ 9 & 7 & 6 \end{vmatrix}$

e) $\begin{vmatrix} 0 & 4 & 8 \\ 0 & 6 & 9 \\ 3 & 7 & 3 \end{vmatrix}$

11. $A=\begin{vmatrix} a_{11} & a_{12} \\ a_{21} & a_{22} \end{vmatrix}$ $B=\begin{vmatrix} ka_{11} & ka_{12} \\ a_{21} & a_{22} \end{vmatrix}$ A ile B determinantları arasındaki ilişki için aşağıdakilerden hangisi doğrudur?

(a) B=k.A

b) $B=A^k$

c) B=(k)/(2).A

d) B=A+3

e) $B=k^2.A$

12. Bir determinantta, bir satıra veya sütuna, başka bir satır veya sütunun bir skalerle çarpılmışı eklenirse determinantın yeni değeri için aşağıdakilerden hangisi söylenebilir?

a) Yeni determinantın değeri ilkinin k katı kadar artar.

(b) Yeni determinantın değeri değişmez.

c) Yeni determinantın değeri sütun sayısı kadar artar.

d) Yeni determinantın değeri satır sayısı kadar artar.

e) Yeni determinantın değeri sıfıra eşittir.

13. $\begin{bmatrix} -5 & 10 \\ -2 & 4 \end{bmatrix}$ matrisinin rangı aşağıdakilerden hangisidir?

(a) Rang (A)= 1

b) Rang (A)= 2

c) Rang (A)= 3

d) Rang (A)= 0

e) Rang (A)= 4

14. $\begin{aligned} 2x + 3y + z &= 0 \\ x + y + z &= 1 \\ 2x + 2y - 3z &= 2 \end{aligned}$ denklem sisteminin çözüm kümesi aşağıdakilerden hangisidir?

a) {0, 1, 3}
b) {3, -1, 0}
c) {3, -2, 1}
d) {1, -2, 3}
(e) {3, -2, 0}

LEARNING UNIT: ANALYTIC GEOMETRY

VI. ÖĞRENME BİRİMİ: DOĞRUNUN ANALİTİK İNCELENMESİ

İZLEME TESTİ VI A

1. A(-1,5) ve B(5,-3) noktaları arasındaki uzaklık aşağıdakilerden hangisidir?

   (a) 10

   b) -10

   c) 8

   d) -8

   e) 9

2. A(2,4) ve B(x,-4) noktaları arasındaki uzaklığın 8 birim olması için x ne olmalıdır?

   a) -2

   (b) 2

   c) 0

   d) 3

   e) -1

3. A(5,2) ve B(3,-4) noktalarının oluşturduğu $|AB|$ doğru parçasının orta noktasının koordinatları aşağıdakilerden hangisidir?

   a) (3,4)

   b) (2,3)

   (c) (4,-1)

   d) (2,5)

   e) (-2,-3)

4. A(-3,6) ve B(x,y) noktalarının orta noktasının koordinatlarının (3,9) olması için (x,y) ikilisi aşağıdakilerden hangisi olmalıdır?

   a) (8,14)

   b) (-3,18)

   c) (6,9)

   (d) (9,12)

   e) (8,16)

5. A(x,y) noktasının OY eksenine göre simetriği olan nokta aşağıdakilerden hangisidir?

   a) A_1 (-x,-y)

   b) A_1 (x,-y)

   c) A_1 (x,y)

   d) $A_1 \left(\frac{1}{x}, \frac{1}{y}\right)$

   (e) A_1 (-x,y)

6. A(-8,-9) noktasının OX eksenine göre simetriği olan nokta aşağıdakilerden hangisidir?

   a) (8,9)

   (b) (-8,9)

   c) (8,-9)

   d) (-8,-9)

   e) $\left(\frac{1}{8}, \frac{1}{9}\right)$

7. $\left(-\frac{1}{2}, -3\right)$ noktasının başlangıç noktasına göre simetriği olan nokta aşağıdakilerden hangisidir?

a) (-1/2,-3)

b) (2,-3)

c) (1/2,-3)

(d) (1/2,3)

e) (-1/2,3)

8. A(2,-1) noktasının birinci açı ortaya göre simetriği olan nokta aşağıdakilerden hangisidir?

(a) (-1,2)

b) (-2,-1)

c) (2,1)

d) (-1,-2)

e) (2,-1)

9. A(4,-2) noktasının y=-x doğrusuna göre simetriği olan nokta aşağıdakilerden hangisidir?

a) (-4,2)

(b) (2,-4)

c) (-4,-2)

d) (-2,4)

e) (4,4)

10. A(-3,4) noktasının x=2 doğrusuna göre simetriği olan nokta aşağıdakilerden hangisidir?

a) (4,7)

b) (-6,4)

(c) (7,4)

d) (-3,8)

e) (-7,-4)

11. A(-2,-1/2) noktasının y=3 doğrusuna göre simetriği olan nokta aşağıdakilerden hangisidir?

a) (-6,-1/2)

b) (-2,-3/2)

c) (2,-13/2)

d) (2,3/2)

(e) (-2,13/2)

12. A(2,-6) B(-4,3)

C(x,y)

|AC|=5 |CB| ise C noktasının koordinatları aşağıdakilerden hangisidir?

a) (2,7)

b) (-2,-5)

c) (-3,-7)

d) (-3,-9)

(e) (-3,3/2)

13. A(3,1) ve B(4,-3) noktalarından geçen doğrunun eğimi aşağıdakilerden hangisine eşittir?

a) 4

b) -3

c) -2

d) -1

(e) -4

14. A(3,-2) noktasından geçen ve eğimi m= -1 olan doğrunun denklemi aşağıdakilerden hangisidir?

a) y= x-1

(b) y= -x+1

c) y= -x-1

d) y= x+1

e) y= 2x-1

15. A(5,3), B(8,2) noktalarından geçen doğrunun denklemi aşağıdakilerden hangisidir?

(a) 3y+x-14= 0

b) 3y-x+14= 0

c) -3y+x-14= 0

d) 3y-x+4= 0

e) y-3x+12= 0

16. A(4,2), B(a,3) noktalarından geçen 10y-x= 0 denklemi verilmektedir. Buna göre "a" aşağidakilerden hangisidir?

a) 4

b) 3.2

c) 1

d) 6.1

(e) 4.1

17. A(-4,1), B(2,-2) noktaları verilmektedir. AB doğrusuna paralel olan ve orjin noktasından geçen doğrunun denklemi aşağidakilerden hangisidir?

(a) y+x/2= 0

b) y-x/2= 0

c) y/2+x= 0

d) y/2-x= 0

e) y/2+x/2= 0

18. 3x-y-2= 0 doğrusu verilmektedir. Buna göre aşağıdaki doğrulardan hangisi verilen doğruya diktir?

a) 4y-12x+5= 0

b) 3y-9x+7= 0

c) 2y-5x-8= 0

d) y+x+3= 0

(e) 6y+2x-13= 0

19. $3x-2y+4=0$ ile $(2-3\sqrt{3})y-(3+2\sqrt{3})x+5-\sqrt{3}=0$ doğruları arasındaki açı aşağıdakilerden hangisidir?

a) 30°

(b) 60°

c) 120°

d) 150°

e) 45°

20. $2y+x+8=0$ doğrusu ile 45°'lik açı yapan ve $A(2,3)$ noktasından geçen doğrunun denklemi aşağıdakilerden hangisidir?

a) $y-3x-3=0$

b) $3y-2x-6=0$

(c) $3y-x-7=0$

d) $y+3x+8=0$

e) $3y+x+7=0$

21. $A(2,-4)$ noktasının $2y=3x-12$ doğrusuna olan uzaklığı aşağıdakilerden hangisidir?

a) $\dfrac{1}{\sqrt{13}}$

(b) $\dfrac{2}{\sqrt{13}}$

c) $\dfrac{4}{\sqrt{13}}$

d) $\sqrt{13}$

e) $\dfrac{\sqrt{13}}{4}$

22. $3x+4y-6=0$ ve $3x+4y+9=0$ paralel doğruları arasındaki uzaklık aşağıdakilerden hangisidir?

a) 1/3

b) 3

c) $\frac{1}{3}$

(d) 3

e) 2/3

23. $4x-3y+2=0$ ve $6x-8y-1=0$ doğrularının meydana getirdiği açının açı ortay denklemi aşağıdakilerden hangisidir?

(a) $8x-6y+4=\mp(6x-8y-1)$

b) $6x-8y+4=\mp(8x+6y-1)$

c) $8x+6y+4=\mp(6x+8y-1)$

d) $6x-3y+1=\mp(3x+2y-1)$

e) $4x-3y+2=\mp(3x-4y-1)$

24. $x-4y+3=0$ ve $3x+2y-5=0$ doğrularının kesim noktasından geçen doğrunun denklemi aşağıdakilerden hangisidir?

a) $2x+y-9=0$

b) $6x+7-9=0$

c) $28x+14y-18=0$

d) $14x+7-6=0$

(e) $2x+6y-8=0$

VII. ÖĞRENME BİRİMİ: ÇEMBERİN ANALİTİK İNCELENMESİ

İZLEME TESTİ VII A

1. Merkezi orijinde olan ve yarıçapı $\sqrt{2}$ olan çemberin denklemi aşağıdakilerden hangisidir?

   a) $(x-\sqrt{2})^2 + (y-\sqrt{2})^2 = 4$

   b) $(x-\sqrt{2})^2 + y^2 = \sqrt{2}$

   (c) $x^2+y^2 = 2$

   d) $x^2+(y-\sqrt{2})^2 = 2$

   e) $x^2+y^2 = 4$

2. Merkezi x- ekseni üzerinde ve yarıçapı 8 olan çemberin denklemi aşağıdakilerden hangisidir?

   a) $(x-a)^2+y^2 = 8$

   (b) $(x-a)^2+y^2 = 64$

   c) $x^2+(y-a)^2 = 8$

   d) $x^2+(y-a)^2 = 64$

   e) $(x-a)^2+(y-a)^2 = 64$

3. Merkezi y ekseni üzerinde ve yarıçapı r olan çemberin denklemi aşağıdakilerden hangisidir?

   a) $(x-a)^2+(y-b)^2 = r^2$

   b) $x^2+y^2 = r^2$

   c) $(x-a)^2+y^2 = r^2$

   (d) $x^2+(y-b)^2 = r^2$

   e) $x^2+(y-b)^2 = r$

4. Koordinatları C (-2,2) olan ve OX- eksenine teğet olan çemberin denklemi aşağıdakilerden hangisidir?

a) $(x-2)^2+y+2)^2= 4$

b) $(x+2)^2+(y+2)= 4$

(c) $(x+2)^2+(y-2)^2= 4$

d) $(x-2)^2+(y-2)^2= 4$

e) $(x-2)^2+(y+2)^2= 2$

5. Merkezi C (3,4) ve OY eksenine teğet olan çemberin denklemi aşağıdakilerden hangisidir?

(a) $(x-3)^2+(y-4)^2= 9$

b) $(x-4)^2+(y-3)^2= 16$

c) $(x-3)^2+(y-4)^2= 16$

d) $(x-4)^2+(y-3)^2= 9$

e) $(x-3)^2+(y-4)^2= 25$

6. Yarıçapı r ve çember denklemi $(x-a)^2+(y-b)^2=r^2$ olan çember OX ve OY eksenine teğettir. Buna göre aşağıdaki ifadelerden hangisi doğrudur?

a) a=r

b) b=r

c) $a=b\neq r$

(d) a=b=r

e) $a\neq b\neq r$

7. Yarıçapı 4 ve OX, OY eksenine teğet olan çemberin denklemi aşağıdakilerden hangisidir?

(a) $(x-4)^2+(y-4)^2= 16$

b) $(x-2)^2+(y-2)^2= 16$

c) $(x-2)^2+y^2= 16$

d) $x^2+(y-2)^2= 16$

e) $(x-2)^2+(y-2)^2= 4$

8. $(x-a)^2+(y-b)^2= a^2$ denkleminin koordinat sistemine göre konumunu aşağıdaki ifadelerden hangisi tanımlar?

a) Merkezinin koordinatları (a,b) olan ve merkezi başlangıç noktasında olan çember denklemi.

b) Merkezinin koordinatları (a,b) olan ve OX eksenine teğet olan çember denklemi.

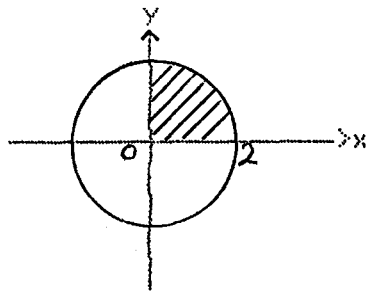
c) Merkezinin koordinatları (a,b) olan ve OX ve OY eksenine teğet olan çember denklemi.

(d) Merkezinin koordinatları (a,b) olan ve OY eksenine teğet olan çember denklemi.

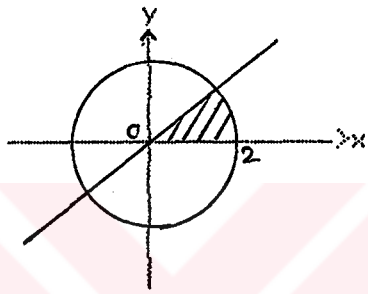
e) Merkezinin koordinatları (a,b) olan ve orijine teğet olan çember denklemi.

9. {(x,y) | $x^2+y^2 \leq 4 \wedge y < x \wedge y > 0$} cümlesi aşağıdaki şekillerde içi taralı hangi bölgeyi gösterir?

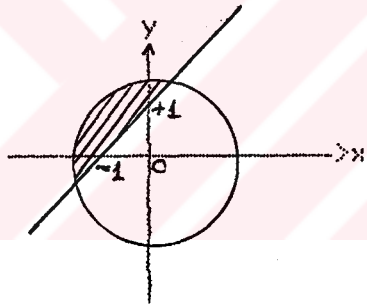
a)



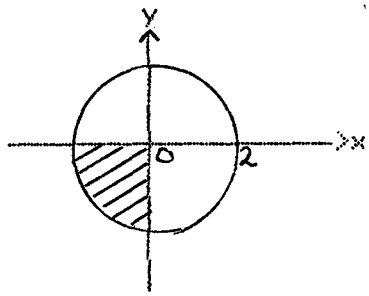
(b)



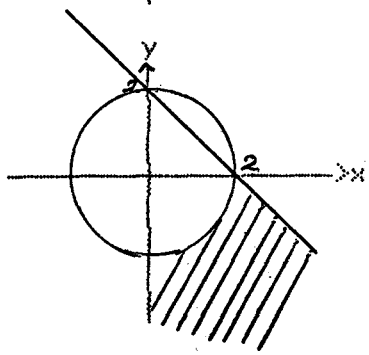
c)



d)



e)



10. $x^2+y^2-6x+4y-3=0$ denklemi bir çemberi gösterdiğine göre bu çemberin merkezinin koordinatları aşağıdakilerden hangisidir?

a) $(-3,2)$

b) $(-3,-2)$

c) $(3,2)$

d) $(-2,-3)$

(e) $(3,-2)$

11. $x^2+y^2+8x+6y+16=0$ olarak verilen çember denklemine göre çemberin yarıçapı aşağıdakilerden hangisidir?

a) 8

b) 4

c) $\frac{\sqrt{84}}{2}$

d) 5

(e) 3

12. A(0,1), B(0,6) ve C(3,0) noktalarından geçen çember denklemi aşağıdakilerden hangisidir?

a) $x^2+y^2-5x-7y+6=0$

b) $x^2+y^2+5x+7y+6=0$

c) $x^2+y^2+5x+7y-6=0$

(d) $x^2+y^2-5x-6y-7=0$

e) $x^2+y^2+5x+6y+7=0$

13. $x^2+y^2+2x+4y-4=0$ çemberi denklemi veriliyor. $(x_o,-2)$ noktasının çember üzerinde bir nokta olması için x_o bilinmeyeninin çözüm kümesi aşağıdakilerden hangisidir?

a) (-2,4)

b) (-2,2)

(c) (-4,2)

d) (-4,4)

e) (2,4)

14. $x^2+y^2=5$ çemberinin üzerindeki bir A(1,9) noktasından çizilen teğetin denklemi aşağıdakilerden hangisidir?

(a) $4x+36y=20$

b) $5x+20y=12$

c) $2x+10y=6$

d) $2x+6y=20$

e) $5x+15y=10$

15. Yarıçapı 4 ve OX, OY eksenine teğet olan çemberin (5,7) noktasından çizilen teğetin denklemi aşağıdakilerden hangisidir?

a) $x+y=16$

b) $3x+y=16$

(c) $x+3y=16$

d) $3x+3y=16$

e) $2x+3y=16$

16. $x^2+y^2= r^2$ merkezcil çemberin üzerinde olan (x_o,y_o) noktasındaki teğetin normal denklemi aşağıdakilerden hangisidir?

(a) $y= \frac{y_o}{x_o} .x$

b) $y= \frac{x_o}{y_o} .x$

c) $y=(y_o-x_o).x$

d) $y=(x_o-y_o).x$

e) $y=(y_o.x_o).x$

17. $x^2+y^2-2x+4y+5= 0$ ve $x^2+y^2+5x-y+3= 0$ çemberlerinin ortak kirişinin denklemi aşağıdakilerden hangisidir?

a) $3x+5y+4= 0$

b) $3x-5y+4= 0$

c) $7x-5y+2= 0$

(d) $-7x+5y+2= 0$

e) $3x+7y+2= 0$

18. Aşağıdaki noktalardan hangisi $x+2y-1= 0$ doğrusu ve $x^2+y^2= 2$ çemberinin arakesitinin bir elemanıdır?

a) $(1,-1)$

b) $(2,-\frac{1}{2})$

(c) $(-1,1)$

d) $(3,-1)$

e) $(-1,-1)$

19. M(1,3) merkezli ve $4x+3y+2=0$ doğrusuna teğet olan çemberin denklemi aşağıdakilerden hangisidir?

a) $(x-1)^2+(y-3)^2=5$

(b) $(x-1)^2+(y-3)^2=9$

c) $(x+1)^2+(y+1)^2=9$

d) $(x-1)^2+(y-3)^2=3$

e) $(x-1)^2+(y-1)^2=225$

VI. ÖĞRENME BİRİMİ: DOĞRUNUN ANALİTİK İNCELENMESİ

İZLEME TESTİ VI B

1. A(-2,1) ve B(2,-3) noktaları arasındaki uzaklık aşağıdakilerden hangisidir?

   a) $2\sqrt{3}$

   (b) $4\sqrt{2}$

   c) $2\sqrt{2}$

   d) $3\sqrt{3}$

   e) $3\sqrt{2}$

2. A(-8,y), B(-2,-4) noktaları arasındaki uzunluğun 10 birim olması için A noktasının ordinatı aşağıdakilerden hangisi olmalıdır?

   a) -4

   b) -5

   (c) 4

   d) 5

   e) -3

3. A(-5,-3), B(-7,-7) noktalarının orta noktasının koordinatları aşağıdakilerden hangisidir?

   a) (6,5)

   b) (5,6)

   c) (-5,-6)

   (d) (-6,-5)

   e) (-7,-6)

4. C(-1,2) noktası A ve B'nin orta noktasıdır. A(-6,3) olduğuna göre B'nin koordinatları aşağıdakilerden hangisidir?

   a) (4,2)

   b) (-4,-1)

   c) (-4,1)

   d) (4,-1)

   (e) (4,1)

5. A(-1/3,-2/3) noktasının OY eksenine göre simetriği olan nokta aşağıdakilerden hangisidir?

   a) (1/3,2/3)

   b) (-1/3,2/3)

   c) (-1/3,-2/3)

   (d) (1/3,-2/3)

   e) (3,3/2)

6. A(-2,3, 3,2) noktasının OX eksenine göre simetriği olan nokta aşağıdekilerden hangisidir?

   a) (-2,3 3,2)

   b) (2,3 3,2)

   (c) (-2,3 -3,2)

   d) (2,3 3,2)

   e) (3,2 2,3

7. A(-2,-3) noktasının başlangıç noktasına göre simetriği olan nokta aşağıdakilerden hangisidir?

   a) (-2,3)

   (b) (2,3)

   c) (2,-3)

   d) (-2,-3)

   e) (3,2)

8. A(-2,-3) noktasının birinci açı ortaya göre simetriği olan nokta aşağıdakilerden hangisidir?

   a) (3,2)

   b) (3,-2)

   c) (-3,2)

   (d) (-3,-2)

   e) (2,3)

9. A(-2,-3) noktasının ikinci açı ortaya göre simetriği olan nokta aşağıdakilerden hangisidir?

   a) (-2,-3)

   b) (3,-2)

   c) (-3,2)

   d) (-3,-2)

   (e) (3,2)

10. A(-2,-3) noktasının x=1 doğrusuna göre simetriği olan nokta aşağıdakilerden hangisidir?

    a) (-1,-3)

    (b) (4,-3)

    c) (-3,-4)

    d) (-4,3)

    e) (-3,4)

11. A(-2,-3) noktasının y=1 doğrusuna göre simetriği olan nokta aşağıdakilerden hangisidir?

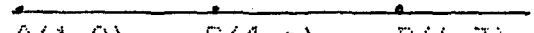
    a) (-2,-4)

    b) (-3,-3)

    (c) (-2,5)

    d) (2,-5)

    e) (-3,-4)

12. 

A(1,0) ve B(-2,3) noktaları verilen AB doğrusunu λ oranında bölen C(4,y) noktası verilsin. Buna göre λ ve y aşağıdakilerden hangisidir?

a) $\lambda = 3/2$, $y = 2/9$

b) $\lambda = -3/2$, $y = 1$

(c) $\lambda = \frac{-3}{2}$, $y = \frac{9}{10}$

d) $\lambda = 1$, $y = -1/2$

e) $\lambda = 1/2$, $y = -3$

13. A(6,2), B(5,-4) noktalarından geçen doğrunun eğimi aşağıdakilerden hangisidir?

a) 2

b) -3

c) 3

d) -2

(e) 6

14. m=-3 ve A(-3,-2) noktasından geçen doğrunun denklemi aşağıdakilerden hangisidir?

(a) $y+3x+11=0$

b) $y-3x-11=0$

c) $y-3x+11=0$

d) $-y+3x+11=0$

e) $-y+3x-11=0$

15. A(2,1) ve B(3,-2) noktalarından geçen doğrunun denklemi aşağıdakilerden hangisidir?

a) $3x-y-7=0$

(b) $3x+y-7=0$

c) $-3x+y-7=0$

d) $7x+y-3=0$

e) $3x+y-5=0$

16. A(2,6) ve B(a,b) noktalarından geçen doğrunun denklemi $2x+y-10=0$ olarak verilmektedir. Buna göre B(a,b) noktası aşağıdakilerden hangisi olabilir?

a) (3,4)

b) (1,4)

(c) (1,8)

d) (3,8)

e) (4,8)

17. A(-1,3) ve B(-2,-5) noktaları verilmektedir. AB doğrusuna paralel olan ve C(4,2) noktasından geçen doğrunun denklemi aşağıdakilerden hangisidir?

a) $2y-4x+15=0$

(b) $y-8x+30=0$

c) $y-4x+15=0$

d) $y-8x-30=0$

e) $2y-8x+30=0$

18. $6x+8y-5=0$ doğrusuyla aşağıdaki doğrulardan hangisi diktir?

a) $16x+12y-8=0$

b) $12x+16y-7=0$

(c) $24x-18y+16=0$

d) $18x+24y-16=0$

e) $12x+5y+8=0$

19. $y=2x+4$ ve $y=-3x-5$ doğruları kaç derecelik açı altında kesişirler?

(a) 45^o

b) 30^o

c) 60^o

d) 75^o

e) 90^o

20. $\sqrt{3}y-x-9=0$ doğrusuyla pozitif yönde 60^o'lik açı yapan doğrunun denklemi aşağıdakilerden hangisidir?

a) $y+2x=0$

(b) $x=0$

c) $y=x$

d) $y+x=0$

e) $y=0$

21. $2x-y+6=0$ ve $2x-y-1=0$ paralel doğruları arasındaki uzaklık aşağıdakilerden hangisidir?

a) $\frac{5}{\sqrt{5}}$

b) $\frac{8}{\sqrt{5}}$

c) $\frac{6}{\sqrt{5}}$

(d) $\frac{7}{\sqrt{5}}$

e) $\frac{1}{\sqrt{5}}$

22. A(3,-3) noktasının x-1= 0 doğrusuna olan uzaklığı aşağıdakilerden hangisidir?

(a) 1

b) 2

c) 5/2

d) 1/2

e) 3

23. 5x+12y+8= 0 ve 12x-9y-5= 0 doğrularının meydana getirdiği açının açıortay denklemi aşağıdakilerden hangisidir?

a) $15(5x+12y+8)=\mp 12(12x-9y-5)$

b) $13(5x+12y+8)=\mp 15(12x-9y-5)$

(c) $15(5x+12y+8)=\mp 13(12x-9y-5)$

d) $12(5x+12y+8)=\mp 15(12x-9y-5)$

e) $13(5x+12y+8)=\mp 12(12x-9y-5)$

24. 2x+3y-4= 0 ve 2y-x+6= 0 doğrularının kesim noktasından ve a(-1,-2) noktasından geçen doğrunun denklemi aşağıdakilerden hangisidir?

a) 2x-10y+20= 0

b) x-11y-10= 0

c) 2x+11y+20= 0

d) x-10y-10= 0

(e) -2x+11y+20= 0

VII. ÖĞRENME BİRİMİ: ÇEMBERİN ANALİTİK İNCELENMESİ

İZLEME TESTİ VII B

1. Merkezi başlangıç noktasından olan ve yarıçapı 4 olan çemberin denklemi aşağıdakilerden hangisidir?

   a) $(x-4)^2+(y-4)^2= 16$

   (b) $x^2+y^2= 16$

   c) $x^2+(y-4)^2= 16$

   d) $x^2+y^2= 4$

   e) $(x-4)^2+y^2= 16$

2. Merkezi x- ekseni üzerinde ve yarıçapı 2 olan çemberin denklemi aşağıdakilerden hangisidir?

   a) $(x-a)^2+(y-a)^2= 2$

   b) $x^2+y^2= 2$

   (c) $(x-a)^2+y^2= 4$

   d) $x^2+(y-a)^2= 4$

   e) $(x-a)^2+(y-a)^2= 4$

3. Merkezi y ekseni üzerinde olan ve y eksenini 0 ve 4 noktalarında kesen çemberin yarıçapı $\sqrt{3}$ olduğuna göre denklemi aşağıdakilerden hangisidir?

a) $x^2+y^2= 16$

b) $(x-2)^2+(y-2)^2= \sqrt{3}$

c) $(x-2)^2+(y-2)^2= 3$

d) $x^2+(y-4)^2= 3$

(e) $x^2+(y-2)^2= 3$

4. Merkezi C(2,-3) ve OX eksenine teğet olan çemberin denklemi aşağıdakilerden hangisidir?

a) $(x-3)^2+(y-2)^2= 13$

b) $(x+3)^2+(y-3)^2= 13$

c) $(x-2)^2+(y-3)^2= 4$

(d) $(x-2)^2+(y+3)^2= 9$

e) $(x-3)^2+(y+2)^2= 9$

5. Merkezinin koordinatları (a,b) olan ve OY eksenine teğet olan çemberin denklemi aşağıdakilerden hangisidir?

a) $x^2+y^2=a^2+b^2$

(b) $(x-a)^2+(y-b)^2=a^2$

c) $(x-a)^2+(y-b)^2=b^2$

d) $(x-b)^2+(y-a)^2=b^2$

e) $(x-b)^2+(y-a)^2=a^2$

6. $(x-2)^2+(y-2)^2= r^2$ denklemi ile verilen çemberin yarıçapı aşağıdakilerden hangisidir?

a) 4

b) 8

c) 16

d) 1

(e) 2

7. Yarıçapı 3 olan OX ve OY eksenine teğet olan çemberin denklemi aşağıdakilerden hangisidir?

   a) $(x-3)^2+(y-3)^2+3$

   b) $(x-3)^2+(y-3)^2= 3$

   (c) $(x-3)^2+(y-3)^2= 9$

   d) $(x-3)^2+(y+3)^2= 9$

   e) $(x+3)^2+(y-3)^2= 18$

8. $x^2+(y-2)^2= 3$ denkleminin koordinat sistemine göre konumu aşağıdakilerden hangisidir?

   (a) Merkezi y ekseni üzerinde bulunan ve yarıçapı $\sqrt{3}$ olan çember denklemi

   b) Merkezi x ekseni üzerinde bulunan ve yarıçapı $\sqrt{3}$ olan çember denklemi

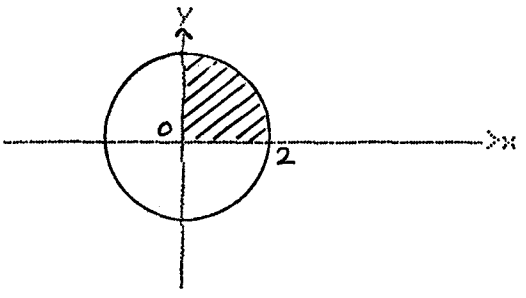
   c) OX ve OY eksenlerine teğet olan ve yarıçapı 3 olan çember denklemi.

   d) OX ve OY eksenlerini (2,2) noktalarında kesen ve yarıçapı 3 olan çember denklemi.

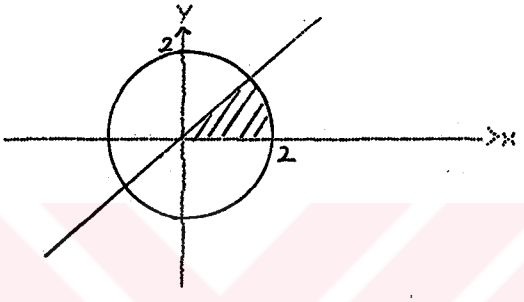
   e) Merkezi başlangıç noktalarında bulunan ve yarıçapı $\sqrt{3}$ olan çember denklemi.

9. {(x,y)| $x^2+y^2 \leq 4 \wedge x+y>2$} cümlesi için taralı bölgelerden hangisidir?

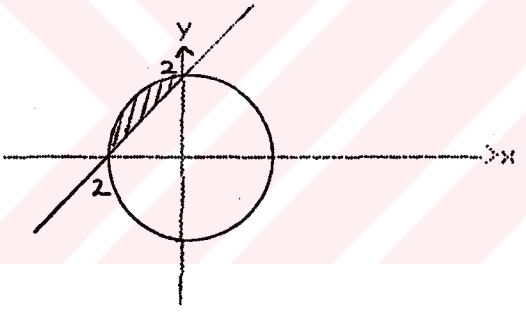
a)



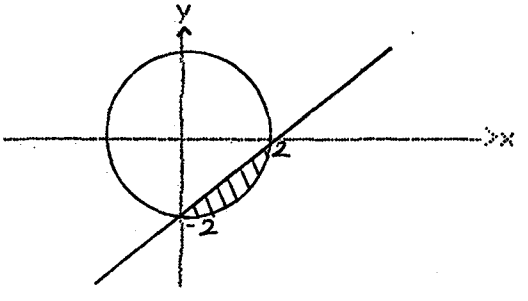
b)



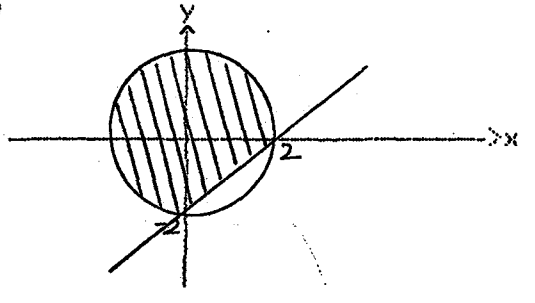
c)



(d)



e)



10. $2x^2+2y^2+Dx+Ey+F=0$ denklemi bir çemberi gösterdiğine göre bu çemberin merkezinin koordinatları aşağıdakilerden hangisidir?

a) $(-2D,-2E)$

b) $(-D,-E)$

c) $(-D/2,-E/2)$

(d) $(-D/4,-E/4)$

e) $(D/2,E/2)$

11. $x^2+y^2+4x-12y+15=0$ denklemi ile verilen çemberin yarıçapı aşağıdakilerden hangisidir?

(a) 10

b) 8

c) 6

d) 12

e) 14

12. A(2,1), B(0,2), C(-1,0) noktalarından geçen çember denklemi aşağıdakilerden hangisidir?

a) $x^2+y^2+7x+y+10=0$

b) $x^2+y^2-7x-y-10=0$

(c) $3x^2+3y^2-7x-y-10=0$

d) $3x^2+3y^2+7x+y+10=0$

e) $x^2+y^2+7x-y+10=0$

13. $(3,y_o)$ noktasının $x^2+y^2-12x+11=0$ çemberinin içinde olması halinde y_o aşağıdakilerden hangisidir?

a) $y_o<-4$

b) $y_o>4$

c) $-4\leq y_o\leq 4$

(d) $-4<y_o<4$

e) $y_o\leq -4$ ve $y_o\geq 4$

14. Denklemi $x^2+y^2= 9$ olan çembere üzerindeki bir (3,-2) noktasında çizilen teğetin denklemi aşağıdakilerden hangisidir?

a) $-3x+2y= 9$

(b) $3x-2y= 9$

c) $-9x+4y= 81$

d) $9x+4y= 81$

e) $3x+2y= 81$

15. Denklemi $(x+3)^2 + (y-2)^2= 8$ olan çembere üzerindeki bir (1,-2) noktasında çizilen teğetin denklemi aşağıdakilerden hangisidir?

a) $x-y+1= 0$

b) $-x+y+1= 0$

c) $x-y-3= 0$

d) $x+y+3= 0$

(e) $-x+y-3= 0$

16. $x^2+y^2= 4$ merkezcil çemberin üzerinde olan (2,4) noktasındaki teğetin normal denklemi aşağıdakilerden hangisidir?

a) $y= -2x$

b) $y= \frac{1}{2} x$

(c) $y= 2x$

d) $y= 8x$

e) $y= \frac{1}{2} x$

17. $x^2+y^2-5x-1=0$ çemberi ile $x^2+y^2-5y+4=0$ çemberinin kuvvet ekseni aşağıdakilerden hangisidir?

a) $y=-x-1$

(b) $y=x+1$

c) $y=-x+1$

d) $y=2x+1$

e) $y=x-1$

18. Aşağıdaki noktalardan hangisi $x-y=1$ doğrusu ve $x^2+y^2=3$ çemberinin arakesitinin bir elemanıdır?

a) $(-2\sqrt{5},\ 2\sqrt{5})$

(b) $\left(\frac{-1+\sqrt{5}}{2},\ \frac{1+\sqrt{5}}{2}\right)$

c) $(-3/2, 7/4)$

d) $(5/2,\ 7/2)$

e) $(-1,1)$

19. M $(2,3)$ merkezli ve $2x+3y+13=0$ doğrusuna teğet olan çemberin denklemi aşağıdakilerden hangisidir?

(a) $(x-2)^2+(y-3)^2=52$

b) $(x-2)^2+(y-3)^2=26$

c) $(x-2)^2+(y-3)^2=13$

d) $(x-2)^2+(y-3)^2=\sqrt{13}$

e) $(x-2)^2+y-3)^2=169$

MATEMATİK ERİŞİ TESTİ

1. Aşağıdaki fonksiyonlardan hangisinin [0,3] aralığında integrali alınabilir?

a) $f(x)=\begin{cases} x+1, & 0\le x<1 \\ x, & 2<x<3 \end{cases}$

b) $f(x)=\dfrac{1}{(x-1)^2}$

(c) $f(x)=\begin{cases} \dfrac{1}{x^2+1}, & 0\le x<1 \\ x, & 1<x\le 3 \end{cases}$

d) $f(x)=\operatorname{tg}\dfrac{\pi x}{4}$

e) $f(x)=\begin{cases} \dfrac{1}{x^2+1}, & 0\le x<1 \\ \dfrac{4}{x^2-4}, & 1\le x\le 3 \end{cases}$

(I.Öğrenme Birimi, Öğrenme Hedefi IA)

2. $\int_a^b f(x)dx=4$, $\int_a^b g(x)dx=-2$ ise $\int_a^b[2f(x)+4g(x)]dx$ kaçtır?

a) 2

b) -8

(c) 0

d) -2

e) 6

(I.Öğrenme Birimi, Öğrenme Hedefi VIIA)

3. $f(x)=\int_{4}^{x^2} t^{3}.dt$ ise $f(2)$ kaçtır?

(a) 0

b) 2

c) 4

d) 6

e) 8

(I.Öğrenme Birimi, Öğrenme Hedefi IXA)

4. $f'(x)=\sqrt{x-1}$ ve $f(2)=1$ olduğuna göre $f(5)$ aşağıdakilerden hangisidir?

a) $\frac{5}{3}$

b) $\frac{10}{3}$

c) $\frac{14}{3}$

(d) $\frac{17}{3}$

e) $\frac{20}{3}$

(I.Öğrenme Birimi, Öğrenme Hedefi XIIA)

5. $\int \left(\frac{12x^2+16x}{x^3+2x^2+4}\right)dx$ ifadesinin eşiti nedir?

a) $4\sqrt{x^3+2x^2+4}$

b) $\sqrt{x^3+2x^2+4}$

(c) $4\ln|x^3+2x^2+4|$

d) $\ln|x^3+2x^2+4|$

e) $\frac{1}{x^3+2x^2+4}$

(I.Öğrenme Birimi, Öğrenme Hedefi XVA)

6. $\int \frac{xdx}{(x+2)(x-4)}$ dx ifadesinin eşiti aşağıdakilerden hangisidir?

a) $\ln|x+2|+\ln|x-4|+c$

b) $\frac{1}{3}\ln|x+2|-\frac{1}{3}\ln|x-4|+c$

c) $\frac{1}{3}\ln|x+2|+\frac{1}{3}\ln|x-4|+c$

(d) $\frac{1}{3}\ln|x+2|+\frac{2}{3}\ln|x-4|+c$

e) $\frac{1}{3}\ln|x+2|-\frac{2}{3}\ln|x-4|+c$

(I.Öğrenme Birimi, Öğrenme Hedefi XVIIA)

7. $\int \frac{2x+2}{(x^2+2x+2)}\,dx$ ifadesinin eşiti nedir?

a) $\sqrt{x^2+2x+2}+c$

b) $-\sqrt{x^2+2x+2}+c$

(c) $\ln|x^2+2x+2|+c$

d) $-\ln|x^2+2x+2|+c$

e) $\ln|x^2+2x|+c$

(I.Öğrenme Birimi, Öğrenme Hedefi XIXA)

8. Aşağıdaki fonksiyonlardan hangisinin integrali vardır?

(a) $\int_0^{3\pi/4} \tan x.dx$

b) $\int_0^{\pi/2} \text{Cot}x.dx$

c) $\int_0^{10} \log x.dx$

d) $\int_0^{\pi/2} \text{Cosec}x$

e) $\int_0^1 \frac{1}{3x^2+2x-5}$

(I.Öğrenme Birimi, Öğrenme Hedefi VIB)

9. $\int_a^c f(x)dx=0$ ise c aşağıdakilerden hangisine eşittir?

(a) a

b) b

c) ab/2

d) (a+b)/2

e) (b-a)/2

(I.Öğrenme Birimi, Öğrenme Hedefi IXB)

10. $f(x)\ \int_2^{x^3} e^t dt$ ise $f'(x)$ aşağıdakilerden hangisidir?

a) $e^x - e^2$

b) $e^{x^3} - e^2$

c) $x^3 . e^{x^3}$

(d) $3x^2 . e^{x^3}$

e) $3e^{x^2} - e^{3x^2}$

(I.Öğrenme Birimi, Öğrenme Hedefi XIB)

11. $\int \text{Sin } 5x\ dx$ eşiti nedir?

a) $\frac{1}{5}$ Sin 5x+c

b) $-\frac{1}{5}$ Sin 5x+c

c) $\frac{1}{5}$ Cos 5x+c

(d) $-\frac{1}{5}$ Cos 5x

e) $\frac{1}{5}$ tan 5x

(I.Öğrenme Birimi, Öğrenme Hedefi XIVB)

12. $\int e^{3x^2+x}\ (6x+1)dx$ ifadesinin eşiti nedir?

a) $\ln|3x^2+x|+c$

b) $-\ln|3x^2+x|+c$

c) $\ln|6x+1|+c$

d) $-e^{(3x^2+x)}+c$

(e) $e^{(3x^2+x)}+c$

(I.Öğrenme Birimi, Öğrenme Hedefi XVB)

13. $\int \frac{dx}{x^2(x-1)}$ ifadesinin eşiti aşağıdakilerden hangisidir?

a) $\ln|x-1|+1/x+c$

b) $\ln|x(x-1)|+x+c$

c) $\ln|x(x-1)|+1/x+c$

d) $\ln|x^2-1|+1/x+c$

(e) $\ln\left|\frac{x-1}{x}\right| + \frac{1}{x} + c$

(I.Öğrenme Birimi, Öğrenme Hedefi XVIIB)

14. $\int \frac{\text{Sin } 2x}{1+\text{Sin}^2x}\,dx$ ifadesinin eşiti aşağıdakilerden hangisidir?

(a) $\ln|1+\text{Sin}^2x|+c$

b) $-\ln|1+\text{Sin}^2x|+c$

c) $\ln|1+\text{Cos}^2x|+c$

d) $-\ln|1+\text{Cos}^2x|+c$

e) $\ln|1-\text{Sin}^2x|+c$

(I.Öğrenme Birimi, Öğrenme Hedefi XIXB)

15. $\int_a^b f(x).dx = F(x)\Big|_a^b$ integralinin sonucu 3 ise aşağıdaki lerden hangisi doğrudur?

a) $F(b) = \frac{3}{F(a)}$

b) $F(b) = 3.F(a)$

c) $F(b) = 3-F(a)$

(d) $F(b) = 3+F(a)$

e) $F(b-a) = 3$

(I.Öğrenme Birimi, Öğrenme Hedefi IVC)

16. $\int_{-1}^{2} (x-1)^2\,dx$ integralinin sonucu aşağıdakilerden hangisidir?

a) $\frac{1}{3}$

(b) 1

c) 0

d) -1

e) $-\frac{1}{3}$

(I.Öğrenme Birimi, Öğrenme Hedefi XC)

17. $f'(x)=e^x$ ve $f(0)=1$ ise $f(1)$ aşağıdakilerden hangisidir?

a) e^2

(b) e

c) 0

d) $\frac{1}{e}$

e) $\frac{1}{e^2}$

(I.Öğrenme Birimi, Öğrenme Hedefi XIIC)

18. $\int (1+\tan^2 x)\,dx$ ifadesinin eşiti aşağıdakilerden hangisidir?

a) Secx

b) Cotx

(c) Tanx

d) $\tan^2 x$

e) Sin2x

(I.Öğrenme Birimi, Öğrenme Hedefi XIVC)

19. $\int \frac{2x+1}{x^2-3x+2}\,dx$ ifadesinin eşiti aşağıdakilerden hangisidir?

(a) $5\ln|x-2|-3\ln|x-1|$

b) $3\ln|x-2|-5\ln|x-1|$

c) $5\ln|x-2|+3\ln|x-1|$

d) $3\ln|x-2|+5\ln|x-1|$

e) $3\ln|x+2|-5\ln|x+1|$

(I.Öğrenme Birimi, Öğrenme Hedefi XVIIC)

20. $\int \frac{1+\tan^4 x}{2-\sec^2 x}\,dx$ ifadesinin eşiti aşağıdakilerden hangisidir?

a) $1+\tan 2x$

(b) $\tan x$

c) $\tan^2 x$

d) $\cot x$

e) $\cot^2 x$

(I.Öğrenme Birimi, Öğrenme Hedefi XVIIIC)

21. $\int_{-\pi}^{\pi} |\sin|\,dx$ ifadesinin eşiti aşağıdakilerden hangisidir?

a) 0

b) 3

c) 2

(d) 4

e) -4

(II.Öğrenme Birimi, Öğrenme Hedefi IA)

22. $\int_{1}^{4} [\![x]\!]^{[\![x]\!]+1}\, dx$ ifadesinin eşiti aşağıdakilerden hangisidir?

a) 28

b) 30

c) 31

(d) 32

e) 33

(II.Öğrenme Birimi, Öğrenme Hedefi IIA)

23. $\int_{\pi}^{2\pi} [\![\mathrm{Sin}x]\!] \cdot \mathrm{Sin}x\,dx$ ifadesinin eşiti aşağıdakilerden hangisidir?

a) -2

b) -1

c) 0

d) 1

(e) 2

(II.Öğrenme Birimi, Öğrenme Hedefi IIA)

24. $\int_{-1}^{2} \mathrm{Sgn}\,(x^2-5)\,dx$ ifadesinin eşiti aşağıdakilerden hangisidir?

(a) -3

b) 3

c) -4

d) 4

e) 5

(II.Öğrenme Birimi, Öğrenme Hedefi IIIA)

25. $\int_{-2}^{4} |x+1|\,dx$ ifadesinin değeri aşağıdakilerden hangisidir?

a) -13

b) -4

(c) 13

d) 6

e) 4

(II.Öğrenme Birimi, Öğrenme Hedefi IIIB)

26. $a \in Z$ olmak üzere $\int_{1}^{3} [x+a]\,dx=13$ ise a'nın değeri aşağıdakilerden hangisidir?

a) 1

b) 2

c) 3

d) 4

(e) 5

(II.Öğrenme Birimi, Öğrenme Hedefi VIB)

27. $\int_{-1}^{4} Sgn(x^2-3x+2)\,dx$ ifadesinin değeri aşağıdakilerden hangisidir?

a) 2

b) 4

c) 2.5

d) 5

(e) 3

(II.Öğrenme Birimi, Öğrenme Hedefi VIIB)

28. $\int_{-4}^{2} Sgn(2x+4)\,dx$ ifadesinin değeri aşağıdakilerden hangisidir?

a) 0.5

b) -1

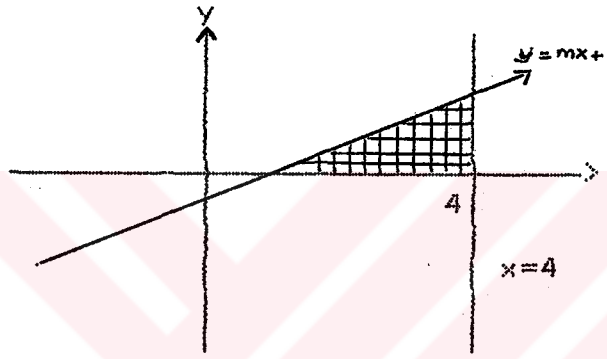
(c) 2

d) 1

e) 3

(II. Öğrenme Birimi, Öğrenme Hedefi IX.B)

29.



Taralı alanın 4 br² olması için "m" aşağıdakilerden hangisi olmalıdır?

a) 2

b) $2+\sqrt{2}$

(c) $\frac{2+\sqrt{3}}{4}$

d) $\frac{2+\sqrt{2}}{4}$

e) $\frac{\sqrt{3}}{2} + 2$

(III.Öğrenme Birimi, Öğrenme Hedefi IIIA)

30. $y=x^2-9$ eğrisi ile $y=0$ (x ekseni) arasındaki bölgenin alanı nedir?

a) 14

(b) 36

c) 26/3

d) 52/3

e) 16

(III.Öğrenme Birimi, Öğrenme Hedefi IVA)

31. $y= \ln x$, $x= 1$, $x= e$ arasındaki alan nedir?

a) 4

b) 2

c) 2.5

d) 1.5

(e) 1

(III.Öğrenme Birimi, Öğrenme Hedefi VIA)

32. $y= x-3$ ve $y= 2x+5$ doğruları ile x - ekseni arasındaki bölgenin alanı nedir?

a) 12

b) 16

(c) 32

d) 25

e) 30

(III.Öğrenme Birimi, Öğrenme Hedefi VIIIA)

33. y= Sin 2x eğrisinin bir periyodunun x ekseni etrafında döndürülmesiyle oluşan hacim aşağıdakilerden hangisidir?

(a) $\frac{\pi^2}{2}$

b) $\frac{\pi^2}{4}$

c) π^2

d) $2\pi^2$

e) $4\pi^2$

(III.Öğrenme Birimi, Öğrenme Hedefi XA)

34. y= $2x^2$ eğrisi y= 0 ve y= 8 doğruları ve y ekseni ile sınırlanan bölgenin y ekseni etrafında döndürülmesinden meydana gelen dönel cismin hacmi aşağıdakilerden hangisidir?

(a) $\pi\left(\frac{y^2}{4}\right)\Big|_0^8$

b) $2\pi\left(\frac{y^3}{4}\right)\Big|_0^8$

c) $2\pi\left(\frac{2y}{4}\right)\Big|_0^8$

d) $\frac{\pi^2 y^2}{4}\Big|_0^8$

e) $2y\pi^2\Big|_0^8$

(III.Öğrenme Birimi, Öğrenme Hedefi XIA)

35. $y = x^4$ eğrisi $y = 0$, $y = 4$ doğruları ve y -ekseni arasında kalan alan y -ekseni etrafında döndürülüyor. Oluşan cismin hacmi kaç br^3 dür?

a) $7/3\pi$

b) $10/3\pi$

(c) $16/3\pi$

d) $19/3\pi$

e) $22/3\pi$

(III.Öğrenme Birimi, Öğrenme Hedefi XIIA)

36. $y = x^2-1$, $y = 0$ (x ekseni) $x = 2$, $x = 3$ arasındaki bölgenin alanı aşağıdakilerden hangisidir?

a) 3/8

b) 5/4

c) 8/3

d) 6/7

(e) 16/3

(III.Öğrenme Birimi, Öğrenme Hedefi VB)

37. $y = e^{3x}$, $y = 0$, $x = 0$, $x = 4$ arasındaki alan aşağıdakilerden hangisidir?

(a) $\dfrac{4}{\ln 2}$

b) $(\ln 2)^2$

c) $\dfrac{1}{\ln 2}$

d) $\ln 2$

e) $\dfrac{\ln 5}{3}$

(III.Öğrenme Birimi, Öğrenme Hedefi VIB)

38. $y= x^3$, $y= x^2$ arasındaki alan nedir?

a) 3/4

b) 2/5

c) 3/5

(d) 1/12

e) 1/4

(III.Öğrenme Birimi, Öğrenme Hedefi VIIB)

39. $y= 2x+3$, $y= -x$ doğruları ile x - ekseni arasında kalan alan aşağıdakilerden hangisidir?

(a) 3/4

b) 1/2

c) 1/4

d) 1

e) 5/4

(III.Öğrenme Birimi, Öğrenme Hedefi VIIIB)

40. $y= x^2-4$ fonksiyonunun $\vec{OX}$ ile sınırlı bölgenin x ekseni etrafında döndürülmesiyle oluşan hacim aşağıdakilerden hangisidir?

a) $\pi\int_{-2}^{2} (4x^3-16x+16)\ dx$

(b) $\pi\int_{-2}^{2} (x^4-8x^2+16)\ dx$

c) $\pi\int_{0}^{2} (x^4-8x^2+16)\ dx$

d) $\pi\int_{-2}^{0} (x^4-8x^2-16)\ dx$

e) $\pi\int_{-1}^{1} (x^4-8x^2+16)\ dx$

(III.Öğrenme Birimi, Öğrenme Hedefi IXB)

41. $y = x^2$ parabolü $x = 1$, $x = 2$ doğruları ve x - ekseni arasında kalan alan x - ekseni etrafında döndürülüyor. Oluşan cismin hacmi kaç br^3 dür?

a) 16π

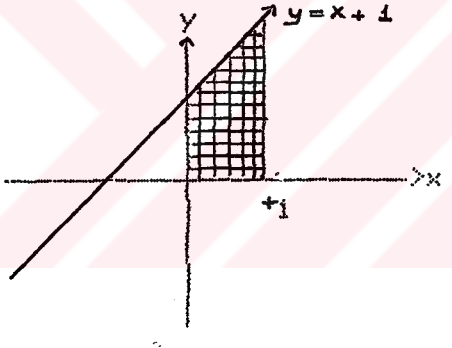
b) $\frac{17\pi}{3}$

(c) $\frac{31\pi}{5}$

d) 8π

e) $\frac{21\pi}{4}$

(III.Öğrenme Birimi, Öğrenme Hedefi XB)

42. 

Şekildeki taralı alan y - ekseni etrafında döndürüldüğünde oluşan cismin hacmi kaç br^3 dür?

a) $\frac{2\pi}{3}$

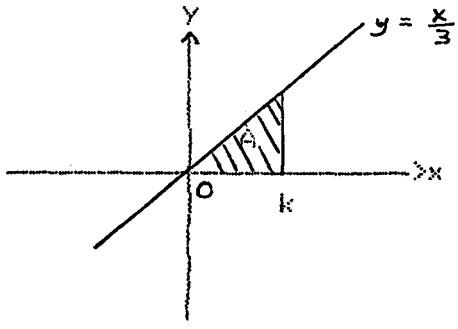
b) π

c) $\frac{4\pi}{3}$

(d) $\frac{5\pi}{3}$

e) 2π

(III.Öğrenme Birimi, Öğrenme Hedefi XIIB)

43. 

Şekildeki taralı alanın sonucu A= 24 br² olduğuna göre "k" aşağıdakilerden hangisidir?

a) 8

b) 9

(c) 12

d) 16

e) 62

(III.Öğrenme Birimi, Öğrenme Hedefi IC)

44. $y + \frac{3}{2}x + 3$ denkleminin x - eksenini kestiği nokta ile x= 2 doğrusu arasında kalan alan aşağıdakilerden hangisidir?

a) 6

b) 8

c) 4

d) 2

(e) 12

(III.Öğrenme Birimi, Öğrenme Hedefi IIIC)

45. y= 2x+1, y= -3x+2 ve x - ekseni arasında kalan alan aşağıdakilerden hangisidir?

a) 5/60

(b) 7/60

c) 4/60

d) 4/30

e) 10/60

(III.Öğrenme Birimi, Öğrenme Hedefi VIIIC)

46. $y = 3x + 1$ doğrusunun $x = -1/3$ ve $x = 3$ doğrularıyla sınırlı bölgenin $\overrightarrow{OX}$ ekseni etrafında döndürülmesiyle oluşan geometrik şekilin hacim ifadesi aşağıdakilerden hangisidir?

a) $\pi(9x^2+4+1)\Big|_{-1/3}^{3}$

b) $\pi\left(3x^3+\frac{3}{2}x^2+1\right)\Big|_{-1/3}^{3}$

c) $\pi\left(\frac{x^3}{3}+\frac{3}{2}x^2+x\right)\Big|_{-1/3}^{3}$

d) $\pi(x^3+3x^2+1)\Big|_{-1/3}^{3}$

(e) $\pi(3x^3+3x^2+x)\Big|_{-1/3}^{3}$

(III.Öğrenme Birimi, Öğrenme Hedefi IVC)

47. $y = \sqrt{e^x}$ eğrisinin y - eksenini kestiği nokta ile $x = 2$ doğrusu arasında sınırlı bölgenin x - ekseni etrafında döndürülmesiyle oluşan şeklin hacmi aşağıdakilerden hangisidir?

a) πe

b) πe^2

(c) $\pi(e-1)$

d) $\pi(e^2-1)$

e) $\pi(e^2-e)$

(III.Öğrenme Birimi, Öğrenme Hedefi IVC)

48. $y = 3x^2$ eğrisi $y = 0$ ve $y = 2$ doğruları ve y ekseni ile sınırlanan bölgenin y ekseni etrafında döndürülmesinden meydana gelen dönel cismin hacmi aşağıdakilerden hangisidir?

(a) $\pi \left. \frac{y^2}{6} \right|_0^2$

b) $\pi \left. \frac{y^2}{3} \right|_0^2$

c) $\pi \left. \frac{y}{6} \right|_0^2$

d) $\pi \left. \frac{y}{3} \right|_0^2$

e) $\pi \left. \frac{y^3}{6} \right|_0^2$

(III.Öğrenme Birimi, Öğrenme Hedefi XIC)

49. Matrislerin özellikleri ile ilgili aşağıdaki ifadelerden hangisi doğrudur?

a) $(A+B)^2 = A+B$

b) Asal köşegen üzerindeki elemanlar $a_{i,j}$ biçimindedir.

(c) $A_{3\times2} + B_{3\times2} = C_{3\times2}$

d) $A^2 = 2.A$ dir. (Bir matrisin karesi, kendisinin 2 katına eşittir.)

e) mxn tipi bir matriste m+n tane eleman vardır.

(IV.Öğrenme Birimi, Öğrenme Hedefi IIA)

50. Aşağıdakilerden hangisi simetrik bir matristir?

(a) $\begin{bmatrix} 1 & 6 & 0 \\ 6 & 2 & 4 \\ 0 & 4 & -1 \end{bmatrix}$

b) $\begin{bmatrix} 3 & 0 & 5 \\ 5 & -3 & 2 \\ 0 & 2 & 3 \end{bmatrix}$

c) $\begin{bmatrix} 1 & 2 & 0 \\ 2 & 1 & -3 \\ 0 & 3 & 1 \end{bmatrix}$

d) $\begin{bmatrix} -1 & 7 & 3 \\ 7 & 2 & 12 \\ -2 & 12 & 1 \end{bmatrix}$

e) $\begin{bmatrix} 1 & -2 & 7 \\ 2 & 0 & 1 \\ -7 & -1 & 1 \end{bmatrix}$

(IV.Öğrenme Birimi, Öğrenme Hedefi VIA)

51. Aşağıdakilerden hangisi köşegen bir matristir?

a) $\begin{bmatrix} 0 & 1 & 1 \\ 2 & 0 & 2 \\ 3 & 3 & 0 \end{bmatrix}$

(b) $\begin{bmatrix} -1 & 0 & 0 \\ 0 & 2 & 0 \\ 0 & 0 & 3 \end{bmatrix}$

c) $\begin{bmatrix} 3 & 0 & 1 \\ 0 & 3 & 0 \\ 1 & 0 & 3 \end{bmatrix}$

d) $\begin{bmatrix} 0 & 1 & 0 \\ 1 & 0 & 0 \\ 0 & 0 & 1 \end{bmatrix}$

e) $\begin{bmatrix} 1 & 2 & 1 \\ 3 & 1 & 3 \\ 1 & 2 & 1 \end{bmatrix}$

(IV.Öğrenme Birimi, Öğrenme Hedefi VIIIA)

52. $\begin{bmatrix} 3 & -2 \\ 4 & 6 \end{bmatrix} + \begin{bmatrix} -2 & x^2 \\ y & -8 \end{bmatrix} = \begin{bmatrix} 1 & 2 \\ 7 & -2 \end{bmatrix}$

Yukarıdaki ifade'de "x" ve "y" aşağıdakilerden hangisi olmalıdır?

a) x= 4, y= 3

b) x= 3, y= 3

c) x= 1, y= -3

d) x= 2, y= 2

(e) x= -2, y= 3

(IV.Öğrenme Birimi, Öğrenme Hedefi XIA)

53. $k.\begin{bmatrix} 3 & -1 \\ 4 & -2 \end{bmatrix} = \begin{bmatrix} x & -y \\ z & -4 \end{bmatrix}$ olduğuna göre (k,x,y,z) aşağıdakilerden sırası ile hangisine eşittir?

a) (-2,-6,2,-8)

b) (2,-6,-2,8)

(c) (2,6,-2,8)

d) (-2,6,-2)

e) (1/2,6,-8)

(IV.Öğrenme Birimi, Öğrenme Hedefi XIIA)

54. A matrisi 3x4 ve B matrisi 4x1'lik birer matris ise bunların çarpımları olan C matrisinin boyutları aşağıdakilerden hangisidir?

a) 12x4

b) 4x3

(c) 3x1

d) 3x4

e) 4x1

(IV.Öğrenme Birimi, Öğrenme Hedefi XIVA)

55. $A=\begin{bmatrix} 1 & 2 \\ 0 & 3 \end{bmatrix}$ $B=\begin{bmatrix} 1 & 0 & -1 \\ 2 & 3 & -2 \end{bmatrix}$ A.B= C matrisi aşağıdakilerden hangisine eşittir?

a) $\begin{bmatrix} 6 & 9 & -6 \\ 5 & 6 & -5 \end{bmatrix}$

(b) $\begin{bmatrix} 5 & 6 & -5 \\ 6 & 9 & -6 \end{bmatrix}$

c) $\begin{bmatrix} -5 & 6 & 5 \\ -6 & 9 & -6 \end{bmatrix}$

d) $\begin{bmatrix} 9 & -6 & 5 \\ 6 & -5 & 6 \end{bmatrix}$

e) $\begin{bmatrix} 6 & -5 & 6 \\ 9 & -6 & 5 \end{bmatrix}$

(IV.Öğrenme Birimi, Öğrenme Hedefi XVA)

56. $x\begin{bmatrix} 2 \\ 3 \end{bmatrix} + y\begin{bmatrix} 6 \\ -3 \end{bmatrix} = \begin{bmatrix} 6 \\ 5 \end{bmatrix}$ eşitliğini sağlayan x ve y değerleri sırasıyla aşağıdakilerden hangisidir?

(a) (2,1/3)

b) (2,3)

c) (3,2)

d) (3,1/4)

e) (4,1/5)

(IV.Öğrenme Birimi, Öğrenme Hedefi XVIIIA)

57. $\begin{bmatrix} 1 & -4 \\ 0 & [x] \end{bmatrix} = \begin{bmatrix} 1 & -4 \\ 0 & [3x] \end{bmatrix}$ matris eşitliğinin olması için x ne olmalıdır?

a) -1

(b) [0,1/3)

c) (0,1/3]

d) [0,1/3]

e) -2

(IV.Öğrenme Birimi, Öğrenme Hedefi IIIA)

58. $A=\begin{bmatrix} 2 & x & 1 \\ 0 & 3 & y \\ z & -2 & 4 \end{bmatrix}$ matrisi simetrik bir matristir. Buna göre (x,y,z) aşağıdakilerden hangisi olmalıdır?

a) (0,2,-1)

b) (-2,0,4)

c) (-2,-2,1)

d) (3,3,0)

(e) (0,-2,1)

(IV.Öğrenme Birimi, Öğrenme Hedefi VIB)

59. $A=\begin{bmatrix} -2 & -3 \\ -4 & -5 \end{bmatrix}$ $B=\begin{bmatrix} 2 & y \\ x & t \end{bmatrix}$ B matrisi A matrisinin negatifi ise (x,y,t) üçlüsü aşağıdakilerden hangisidir?

a) (-4,3,-5)

b) (-4,-3,-5)

c) (5,4,3)

d) (3,4,5)

(e) (4,3,5)

(IV.Öğrenme Birimi, Öğrenme Hedefi IXB)

60. $\begin{vmatrix} x & y \\ z & t \end{vmatrix} + \begin{vmatrix} -2 & 1 \\ 0 & -3 \end{vmatrix} = \begin{vmatrix} 1 & 3 \\ -1 & -4 \end{vmatrix}$

olduğuna göre (x, y, z, t) aşağıdakilerden hangisine eşittir?

(a) (3,2,-1,-1)

b) (1,-4,1,1)

c) (-1,2,-1,1)

d) (3,-2,1,1)

e) (3,2,1,1)

(IV.Öğrenme Birimi, Öğrenme Hedefi XIB)

61. $A=\begin{bmatrix}-1 & 2 & 1\\ 0 & -3 & 4\\ -6 & 0 & -5\end{bmatrix}$ matrisi ve k= 2 veriliyor. k.(A+B)nin çözümü birim matris olduğuna göre B aşağıdakilerden hangisidir?

a) $B=\begin{bmatrix}3 & -4 & -2\\ 0 & 7 & -8\\ 1 & 0 & -5\end{bmatrix}$

(b) $B=\begin{bmatrix}3/2 & -2 & -1\\ 0 & 7/2 & -4\\ 6 & 0 & -5/2\end{bmatrix}$

c) $B=\begin{bmatrix}3/2 & -4 & -2\\ 0 & 7/2 & -8\\ 12 & 0 & -5\end{bmatrix}$

d) $B=\begin{bmatrix}3 & -2 & -1\\ 0 & 7 & -4\\ 6 & 0 & -5\end{bmatrix}$

e) $B=\begin{bmatrix}3/2 & 2 & 1\\ 0 & 7/2 & 4\\ -6 & 0 & -5\end{bmatrix}$

(IV.Öğrenme Birimi, Öğrenme Hedefi XIIIB)

62. $A=\begin{bmatrix}x & y\\ z & t\end{bmatrix}$ matrisi B (1,2) noktasını C(4,-6)noktasına dönüştürürse, aynı matris (5,10) noktasını hangi noktaya dönüştürür?

a) (2,-3)

b) (10,-20)

(c) (20,-30)

d) (30,-20)

e) (1,-2)

(IV.Öğrenme Birimi, Öğrenme Hedefi XVB)

63. $A=\begin{bmatrix} x & y \\ z & t \end{bmatrix}$ matrisinde her satırın terimleri toplamı 4 olduğuna göre A^2 matrisinin 2. satırındaki terimlerin toplamı aşağıdakilerden hangisine eşittir?

a) 4

b) 8

c) 12

(d) 16

e) 20

(IV.Öğrenme Birimi, Öğrenme Hedefi XVIIB)

64. $x-3\begin{bmatrix} 2 & 5 \\ 1 & 6 \end{bmatrix} + 4 = 0$ denklemini sağlayan x matrisi aşağıdakilerden hangisidir?

a) $\begin{bmatrix} 1 & 4 \\ 1 & 5 \end{bmatrix}$

(b) $\begin{bmatrix} 2 & 15 \\ 3 & 14 \end{bmatrix}$

c) $\begin{bmatrix} 6 & 15 \\ 3 & 18 \end{bmatrix}$

d) $\begin{bmatrix} 4 & 0 \\ 3 & 4 \end{bmatrix}$

e) $\begin{bmatrix} 3 & -7 \\ 4 & 6 \end{bmatrix}$

(IV.Öğrenme Birimi, Öğrenme Hedefi XVIIIB)

65. $\begin{vmatrix} 3 & -2 \\ -3 & 4 \end{vmatrix}$ determinantının sonucu aşağıdakilerden hangisidir?

a) -2

b) 2

(c) 6

d) -6

e) 4

(V.Öğrenme Birimi, Öğrenme Hedefi IA)

66. $\begin{vmatrix} 1 & 3 & 2 \\ 2 & -1 & 4 \\ 5 & 2 & 3 \end{vmatrix}$ determinantının değeri aşağıdakilerden hangisidir?

(a) 49

b) 28

c) 63

d) -57

e) 55

(V.Öğrenme Birimi, Öğrenme Hedefi IIIA)

67. $\begin{vmatrix} 2 & 3 & 1 \\ 0 & -1 & 4 \\ x & 6 & 2 \end{vmatrix} = 0$ ise x aşağıdakilerden hangisidir?

a) 8

b) 7

c) 6

d) 5

(e) 4

(V.Öğrenme Birimi, Öğrenme Hedefi IVA)

68. $\begin{vmatrix} x & 7 \\ 5 & 3 \end{vmatrix} = \begin{vmatrix} 4 & 1 \\ 3 & -2 \end{vmatrix}$ determinantlarının eşitliği verildiğine göre x aşağıdakilerden hangisidir?

a) 3

b) 5

c) 6

(d) 10

e) 7

(V.Öğrenme Birimi, Öğrenme Hedefi VA)

69. Aşağıdaki determinantlardan hangisinin değeri sıfıra eşittir?

a) $\begin{vmatrix} a_{11} & 0 & 0 \\ a_{21} & a_{22} & a_{23} \\ a_{31} & a_{32} & a_{33} \end{vmatrix}$

b) $\begin{vmatrix} a_{11} & a_{12} & 0 \\ a_{21} & a_{22} & a_{23} \\ 0 & a_{32} & a_{33} \end{vmatrix}$

c) $\begin{vmatrix} a_{11} & a_{12} & a_{13} \\ 0 & a_{22} & 0 \\ a_{31} & a_{32} & a_{33} \end{vmatrix}$

(d) $\begin{vmatrix} a_{11} & a_{12} & 0 \\ a_{21} & a_{22} & 0 \\ a_{31} & a_{32} & 0 \end{vmatrix}$

e) $\begin{vmatrix} a_{11} & 0 & a_{13} \\ a_{21} & a_{22} & a_{23} \\ a_{31} & 0 & a_{33} \end{vmatrix}$

(V.Öğrenme Birimi, Öğrenme Hedefi XA)

70. Bir determinantta bir satır veya sütun bir k∈R sayısı ile çarpıldığında yeni determinantın değeri için aşağıdakilerden hangisi söylenebilir?

a) İlk determinantın karesine eşittir.

(b) İlk determinantın k katına eşittir.

c) İlk determinantın k/3 katına eşittir.

d) İlk determinantın 3.k katına eşittir.

e) Değeri değişmez.

(V.Öğrenme Birimi, Öğrenme Hedefi XIA)

71. $A=\begin{bmatrix} 3 & 5 \\ 2 & 6 \end{bmatrix}$ matrisinin rangı aşağıdakilerden hangisidir?

a) Rang (A)= 3

b) Rang (A)= 1

c) Rang (A)= 0

(d) Rang (A)= 2

e) Rang (A)= 4

(V.Öğrenme Birimi, Öğrenme Hedefi XIIIA)

72. $2x+3y+z=9$
$x+2y+3z=6$
$2x+y+2z=9$
(x,y,z) üçlüsü aşağıdakilerden hangisidir?

(a) $\left(\frac{42}{11}, \frac{3}{11}, \frac{6}{11}\right)$

b) $\left(\frac{42}{14}, \frac{3}{14}, \frac{6}{14}\right)$

c) $\left(\frac{42}{9}, \frac{3}{9}, \frac{6}{9}\right)$

d) $\left(\frac{42}{12}, \frac{3}{12}, \frac{6}{12}\right)$

e) $\left(\frac{42}{19}, \frac{3}{19}, \frac{6}{19}\right)$

(V.Öğrenme Birimi, Öğrenme Hedefi XIVA)

73. $\begin{vmatrix} \sin x & \cos x \\ -\cos x & \sin x \end{vmatrix}$ determinantının sonucu aşağıdakilerden hangisidir?

a) $\sin^2 x$

b) $\sin^2 x - \cos^2 x$

c) $\cos^2 x$

(d) 1

e) 0

(V.Öğrenme Birimi, Öğrenme Hedefi IB

74. $\begin{vmatrix} 1 & y & yz \\ 0 & y-x & z(x-y) \\ 0 & z-x & y(x-z) \end{vmatrix}$ determinantının değeri aşağıdakilerden hangisidir?

a) 0

b) $(x^2-y^2)(x-y)$

c) $(x^2-x.z)(z-y)$

d) 1

(e) $(x-y)(x-z)(z-y)$

(V.Öğrenme Birimi, Öğrenme Hedefi IIIB)

75. $\begin{vmatrix} 1 & 2 & 0 \\ 4 & 3 & 2 \\ -5 & -1 & 4 \end{vmatrix}$ determinantında a_{23}'un kofaktörü aşağıdakilerden hangisidir?

a) -11

(b) 11

c) 10

d) 1

e) -10

(V.Öğrenme Birimi, Öğrenme Hedefi VIB)

76. $\begin{vmatrix} 4 & 2 & -3 \\ 2 & 5 & -1 \\ 2 & 4 & -8 \end{vmatrix}$ determinantında a_{33} elemanının minörü aşağıdakilerden hangisidir?

a) -12

b) -10

c) 10

d) 2

(e) 12

(V.Öğrenme Birimi, Öğrenme Hedefi VIIB)

77. Aşağıdaki determinantlardan hangisinin değeri sıfıra eşittir?

(a) $\begin{vmatrix} 2 & 2 & 1 \\ 2 & 2 & 1 \\ 2 & 3 & 4 \end{vmatrix}$

b) $\begin{vmatrix} 2 & 1 & 2 \\ 2 & 1 & 3 \\ 1 & 2 & 1 \end{vmatrix}$

c) $\begin{vmatrix} -9 & -8 & -7 \\ -6 & -5 & -4 \\ -3 & -2 & -1 \end{vmatrix}$

d) $\begin{vmatrix} 1 & 2 & 2 \\ 2 & -1 & 2 \\ 2 & 2 & 1 \end{vmatrix}$

e) $\begin{vmatrix} -1 & 8 & 5 \\ 7 & -2 & 6 \\ 4 & 9 & -3 \end{vmatrix}$

(V.Öğrenme Birimi, Öğrenme Hedefi VIIIB)

78. Aşağıdaki determinantlardan hangisinin değeri sıfıra eşittir?

a) $\begin{vmatrix} 9 & 2 & 3 \\ 5 & 7 & 6 \\ 3 & 2 & 1 \end{vmatrix}$

b) $\begin{vmatrix} 2 & 3 & 5 \\ -3 & -4 & -6 \\ 2 & 5 & 7 \end{vmatrix}$

(c) $\begin{vmatrix} 0 & 0 & 0 \\ 2 & 5 & 7 \\ 3 & 4 & 6 \end{vmatrix}$

d) $\begin{vmatrix} 3 & 2 & 1 \\ 6 & 5 & 4 \\ 9 & 7 & 6 \end{vmatrix}$

e) $\begin{vmatrix} 0 & 4 & 8 \\ 0 & 6 & 9 \\ 3 & 7 & 3 \end{vmatrix}$

(V.Öğrenme Birimi, Öğrenme Hedefi XB)

79. $\begin{bmatrix} -5 & 10 \\ -2 & 4 \end{bmatrix}$ matrisinin rangı aşağıdakilerden hangisidir?

(a) Rang (A)= 1

b) Rang (A)= 2

c) Rang (A)= 3

d) Rang (A)= 0

e) Rang (A)= 4

(V.Öğrenme Birimi, Öğrenme Hedefi XIIIB)

80. $2x + 3y + z = 0$
$x + y + z = 1$
$2x + 2y - 3z = 2$
denklem sisteminin çözüm kümesi aşağıdakilerden hangisidir?

a) $\langle 0, 1, 3 \rangle$

b) $\langle 3, -1, 0 \rangle$

c) $\langle 3, -2, 1 \rangle$

d) $\langle 1, -2, 3 \rangle$

(e) $\langle 3, -2, 0 \rangle$

(V.Öğrenme Birimi, Öğrenme Hedefi XIVB)

81. A(3,-2) noktasından geçen ve eğimi $m = -1$ olan doğrunun denklemi aşağıdakilerden hangisidir?

a) $y = x-1$

(b) $y = -x+1$

c) $y = -x-1$

d) $y = x+1$

e) $y = 2x-1$

(VI.Öğrenme Birimi, Öğrenme Hedefi XIVA)

82. A(-4,1), B(2,-2) noktaları verilmektedir. AB doğrusuna paralel olan ve orjin noktasından geçen doğrunun denklemi aşağıdakilerden hangisidir?

(a) $y+x/2 = 0$

b) $y-x/2 = 0$

c) $y/2+x = 0$

d) $y/2-x = 0$

e) $y/2+x/2 = 0$

(VI.Öğrenme Birimi, Öğrenme Hedefi XVIIA)

83. $2y+x+8=0$ doğrusu ile 45^{o}'lik açı yapan ve A(2,3) noktasından geçen doğrunun denklemi aşağıdakilerden hangisidir?

a) $y-3x-3=0$

b) $3y-2x-6=0$

(c) $3y-x-7=0$

d) $y+3x+8=0$

e) $3y+x+7=0$

(VI.Öğrenme Birimi, Öğrenme Hedefi XXA)

84. A(2,-4) noktasının $2y=3x-12$ doğrusuna olan uzaklığı aşağıdakilerden hangisidir?

a) $\frac{1}{\sqrt{13}}$

(b) $\frac{2}{\sqrt{13}}$

c) $\frac{4}{\sqrt{13}}$

d) $\sqrt{13}$

e) $\frac{\sqrt{13}}{4}$

(VI.Öğrenme Birimi, Öğrenme Hedefi XXIA)

85. $x-4y+3=0$ ve $3x+2y-5=0$ doğrularının kesim noktasından geçen doğrunun denklemi aşağıdakilerden hangisidir?

a) $2x+y-9=0$

b) $6x+7-9=0$

c) $28x+14y-18=0$

d) $14x+7y-6=0$

(e) $2x+6y-8=0$

(VI.Öğrenme Birimi, Öğrenme Hedefi XXIVA)

86. A(-2,-3) noktasının y=1 doğrusuna göre simetriği olan nokta aşağıdakilerden hangisidir?

a) (-2,-4)

b) (-3,-3)

(c) (-2,5)

d) (2,-5)

e) (-3,-4)

(VI.Öğrenme Birimi, Öğrenme Hedefi XIB)

87. A(6,2), B(5,-4) noktalarından geçen doğrunun eğimi aşağıdakilerden hangisidir?

a) 2

b) -3

c) 3

d) -2

(e) 6

(VI.Öğrenme Birimi, Öğrenme Hedefi XIIIB)

88. 6x+8y-5= 0 doğrusuyla aşağıdaki doğrulardan hangisi diktir?

a) 16x+12y-8= 0

b) 12x+16y-7= 0

(c) 24x-18y+16= 0

d) 18x+24y-16= 0

e) 12x+5y+8= 0

(VI.Öğrenme Birimi, Öğrenme Hedefi XVIIIB)

89. $2x-y+6=0$ ve $2x-y-1=0$ paralel doğruları arasındaki uzaklık aşağıdakilerden hangisidir?

a) $\frac{5}{\sqrt{5}}$

b) $\frac{8}{\sqrt{5}}$

c) $\frac{6}{\sqrt{5}}$

(d) $\frac{7}{\sqrt{5}}$.

e) $\frac{1}{\sqrt{5}}$

(VI.Öğrenme Birimi, Öğrenme Hedefi XXIB)

90. $5x+12y+8=0$ ve $12x-9y-5=0$ doğrularının meydana getirdiği açının açıortay denklemi aşağıdakilerden hangisidir?

a) $15(5x+12y+8) = \mp 12(12x-9y-5)$

b) $13(5x+12y+8) = \mp 15(12x-9y-5)$

(c) $15(5x+12y+8) = \mp 13(12x-9y-5)$

d) $12(5x+12y+8) = \mp 15(12x-9y-5)$

e) $13(5x+12y+8) = \mp 12(12x-9y-5)$

(VI.Öğrenme Birimi, Öğrenme Hedefi XXIIIB)

91. Merkezi y ekseni üzerinde ve yarıçapı r olan çemberin denklemi aşağıdakilerden hangisidir?

a) $(x-a)^2+(y-b)^2= r$

b) $x^2+y^2= r^2$

c) $(x-a)^2+y^2= r^2$

(d) $x^2+(y-b)^2= r^2$

e) $x^2+(y-b)^2= r$

(VII.Öğrenme Birimi, Öğrenme Hedefi IIIA)

92. Yarıçapı r ve çember denklemi $(x-a)^2+(y-b)^2= r^2$ olan çember OX ve OY eksenine teğettir. Buna göre aşağıdaki ifadelerden hangisi doğrudur?

a) $a= r$

b) $b= r$

c) $a= b\neq r$

(d) $a=b=r$

e) $a\neq b\neq r$

(VII.Öğrenme Birimi, Öğrenme Hedefi VIA)

93. Yarıçapı 4 ve OX, OY eksenine teğet olan çemberin denklemi aşağıdakilerden hangisidir?

(a) $(x-4)^2+(y-4)^2= 16$

b) $(x-2)^2+(y-2)^2$

c) $(x-2)^2+y^2= 16$

d) $x^2+(y-2)^2= 16$

e) $(x-2)^2+(y-2)^2= 4$

(VII.Öğrenme Birimi, Öğrenme Hedefi VIIA)

94. $x^2+y^2= r^2$ merkezcil çemberinin üzerinde olan (x_o,y_o) noktasındaki teğetin normal denklemi aşağıdakilerden hangisidir?

(a) $y= \frac{y_o}{x_o} .x$

b) $y= \frac{x_o}{y_o} .x$

c) $y= (y_o-x_o).x$

d) $y= (x_o-y_o).x$

e) $y= (y_o.x_o).x$

(VII.Öğrenme Birimi, Öğrenme Hedefi XVIA)

95. M(1,3) merkezli ve $4x+3y+2= 0$ doğrusuna teğet olan çemberin denklemi aşağıdakilerden hangisidir?

a) $(x-1)^2+(y-3)^2= 5$

(b) $(x-1)^2+(y-3)^2= 9$

c) $(x+1)^2+(y+1)^2= 9$

d) $(x-1)^2+(y-3)^2= 3$

e) $(x-1)^2+(y-1)^2= 225$

(VII.Öğrenme Birimi, Öğrenme Hedefi XIXA)

96. Merkezinin koordinatları (a,b) olan ve OY eksenine teğet olan çemberin denklemi aşağıdakilerden hangisidir?

a) $x^2+y^2= a^2+b^2$

(b) $(x+a)^2+(y-b)^2= a^2$

c) $(x-a)^2+(y-b)^2= b^2$

d) $(x-b)^2+(y-a)^2= b^2$

e) $(x-b)^2+(y-a)^2= a^2$

(VII.Öğrenme Birimi, Öğrenme Hedefi VB)

97. $2x^2+2y^2+Dx+Ey+F=0$ denklemi bir çemberi gösterdiğine göre bu çemberin merkezinin koordinatları aşağıdakilerden hangisidir?

a) $(-2D,-2E)$

b) $(-D,-E)$

c) $(-D/2,-E/2)$

(d) $(-D/4,-E/4)$

e) $(D/2,E/2)$

(VII.Öğrenme Birimi, Öğrenme Hedefi XB)

98. Denklemi $x^2+y^2=9$ olan çembere üzerindeki bir $(3,-2)$ noktasında çizilen teğetin denklemi aşağıdakilerden hangisidir?

a) $-3x+2y=9$

(b) $3x-2y=9$

c) $-9x+4y=81$

d) $9x+4y=81$

e) $3x+2y=81$

(VII.Öğrenme Birimi, Öğrenme Hedefi XIVB)

99. $x^2+y^2-5x-1=0$ çemberi ile $x^2+y^2-5y+4=0$ çemberinin kuvvet ekseni aşağıdakilerden hangisidir?

a) $y=-x-1$

(b) $y=x+1$

c) $y=-x+1$

d) $y=2x+1$

e) $y=x-1$

(VII.Öğrenme Birimi, Öğrenme Hedefi XVIIB)

100. Aşağıdaki noktalardan hangisi $x - y = 1$ doğrusu ve $x^2+y^2 = 3$ çemberinin arakesitinin bir elemanıdır?

a) $(-2\sqrt{5}, 2\sqrt{5})$

(b) $\left(\frac{-1+\sqrt{5}}{2}, \frac{1+\sqrt{5}}{2}\right)$

c) $(-3/2, 7/4)$

d) $(5/2, 7/2)$

e) $(-1, 1)$

(VII.Öğrenme Birimi, Öğrenme Hedefi XVIIIB)

SUBJECT AREA: PHYSICS

FİZİK ÖN-TEST

1. Durgunluktan hareketе geçen sabit ivmeli cisim 8'inci saniye içinde 30m. yol alıyor. İvmesi kaç m/sn2 dir?

   a) 2

   (b) 4

   c) 5

   d) 3

   e) 6

2. Bir doğrusal hareketin hızı V=20-5t ile veriliyor. İvmesi nedir?

   a) 4

   b) -4

   c) 5

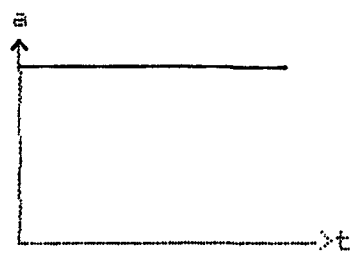
   (d) -5

   e) 15

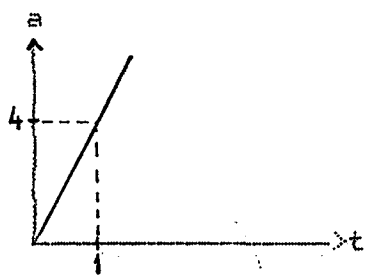
3. | sn | t | 0 | 1 | 2 | 3 | 4 | 5 |
   |---|---|---|---|---|---|---|---|
   | sn | | 0 | 1 | 8 | 27 | 64 | 125 |

   s yolunun t zamanına göre değişimi veriliyor. İvme-zaman grafiği hangisidir?

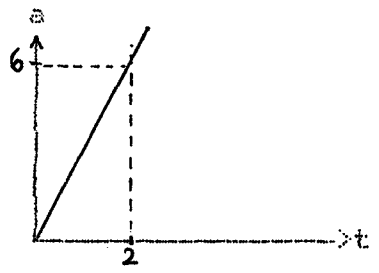
   a)



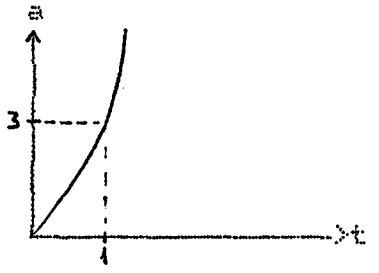
   b)



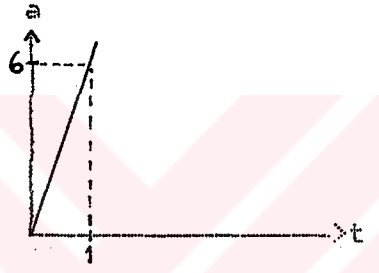
(c)



d)



e)



4. Yol ifadesi S=2t-1 olan hareketin hızı nedir?

a) -1

b) 1

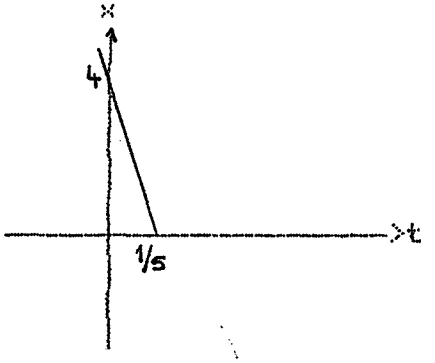
c) -2

(d) 2

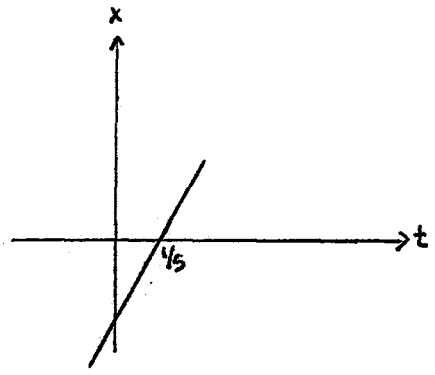
e) 1/2

5. x=20t-4 konum denklemi verilen hareketin (x-t) grafiği aşağıdakilerden hangisidir?

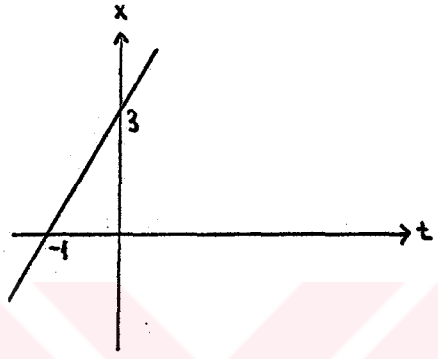
a)



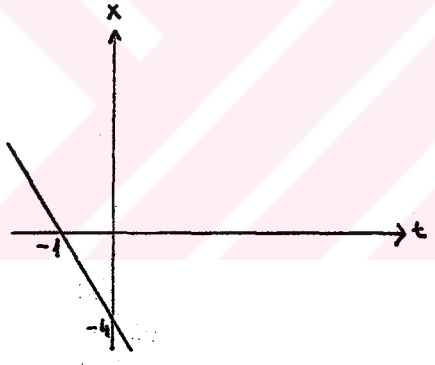
b)



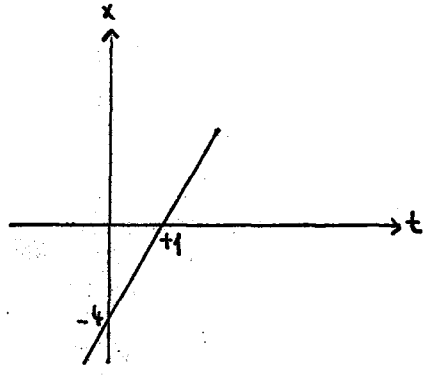
c)

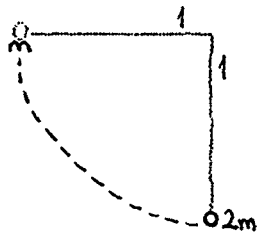


d)



(e)



6. 

A serbest bırakılınca B'ye çarpıp kenetleniyor. B ne kadar hız kazanır?

a) $\frac{\sqrt{2gl}}{\sqrt{3}}$

b) $\sqrt{2gl}$

c) $3\sqrt{2gl}$

d) $\frac{\sqrt{2gl}}{\sqrt{2}}$

(e) $\frac{\sqrt{2gl}}{\sqrt{3}}$

7. 2 m/sn² ivme ile hareket etmekte olan cismin hızı 5'inci saniye sonunda 20 m/sn ise cismin ilk hızı nedir?

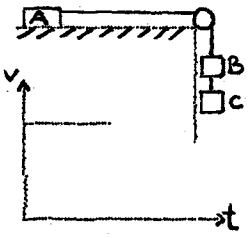
a) 15

b) 12,5

(c) 10

d) 8

e) 2

8. 

m_A= 10kg.
m_B= 4kg.
m_C= 6kg.

BC arasındaki ip kopunca sistemin hız zaman grafiği şekildeki gibi ise sürtünme katsayısı nedir?

a) 0,2

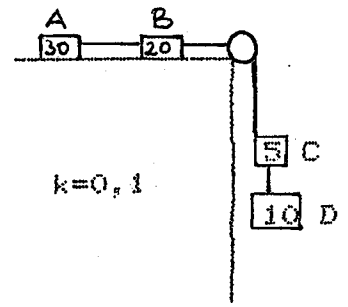
(b) 0,4

c) 0,6

d) 0,8

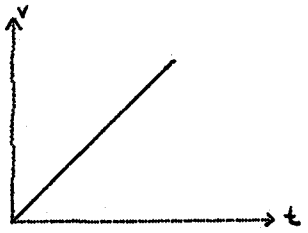
e) 0,5

9.

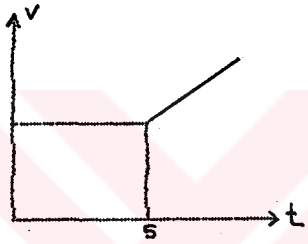


Sistem serbest bırakıldıktan 5 sn. sonra CD ipi kopuyor. Hareketin hız zaman grafiği hangisidir?

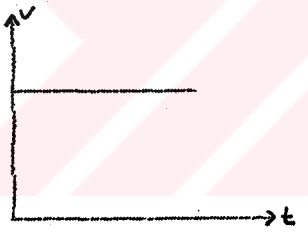
a)



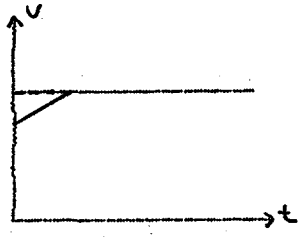
b)



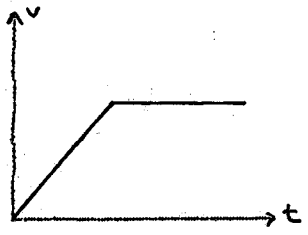
c)



d)



(e)



10. Eğik atılan cismin ilk hızı V_o, atış açısı 60° dir. Menzili $a\sqrt{3}$ bulunuyor. Ayni cisim 30° açı ve V_o ilk hızı ile atılırsa menzili ne olur?

a) $\frac{a}{2}$

b) $2a$

(c) $a\sqrt{3}$

d) $\frac{a\sqrt{3}}{2}$

e) $2a\sqrt{3}$

11. Düşey düzlemde düzgün dairesel hareket yapan cisim için minimum en küçük hız aşağıdakilerden hangisidir? (r=160 m, g=10 m/sn²)

a) 16

b) 4

c) 1600

(d) 40

e) 400

12. Esnek çarpışan iki cismin çarpışma öncesi momentumlarının toplamı 0'dır. Çarpışma sonrası hızları için aşağıdakilerden hangisi geçerlidir?

a) Dururlar

b) Hızlarını değişirler

c) Geldikleri hızlarla devam ederler

(d) Geldikleri hızlarla geri dönerler

e) Kesin bir şey söylenemez

13. Düşey düzlemde minimum hızla dairesel hareket yapan cismin saniyedeki dönme sayısını veren bağıntı aşağıdakilerden hangisidir? (r= Yarıçap, g=π²)

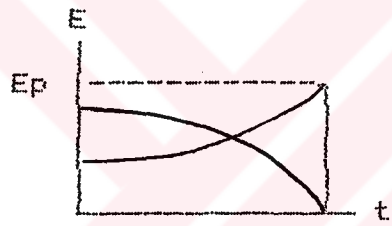
a) T.F= 1

(b) $F = \frac{1}{2\pi\sqrt{r}}$

c) $F = \frac{\sqrt{g}}{\sqrt{4\pi r}}$

d) $F = \frac{1}{2\sqrt{r}}$

e) r.g

14. 

Enerji zaman grafiği verilen atış hangisidir?

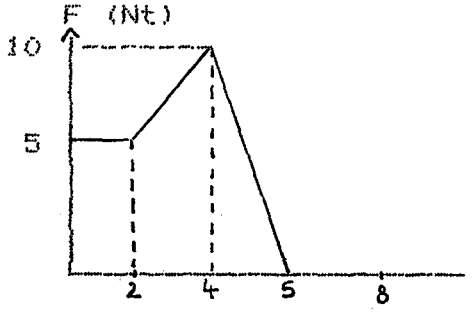
(a) Yukarıdan aşağıya düşey atış

b) Aşağıdan yukarıya atış

c) Serbest düşme

d) Eğik atış

e) Yatay atış

15. 

Kuvvet zaman grafiği verilen 2,8 kg. kütleli cismin 6 m. yol aldıktan sonraki hızı nedir?

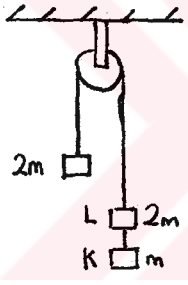
(a) 5

b) 10

c) 35

d) 2,8

e) 15

16. 

Sistem serbest bırakıldıktan 5 sn sonra KL ipi kesilirse sistem ve K'nin yapacakları hareketler hangileridir?

a) Sistem hızlanır. K doğrusal

b) Sistem hızlanır. K aşağı düşey atış

(c) Sistem doğrusal. K aşağı düşey atış

d) Her ikisi de doğrusal

e) K aşağı atış, sistem yavaşlıyor

17. Aşağıdakilerden hangisi kütle birimi olabilir?

a) Nt/kg

b) $\frac{kg.m}{sn^2}$

(c) $\frac{kg.sn^2}{m}$

d) kg-kuvvet

e) $\frac{joule}{kg.}$

18. Hızın zamana göre 1. türevi aşağıdakilerden hangisidir?

(a) İvme

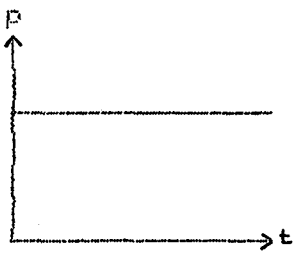
b) Kuvvet

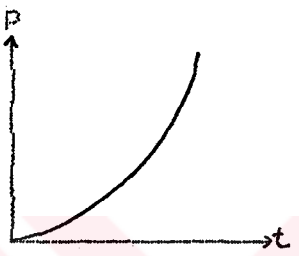
c) Hız

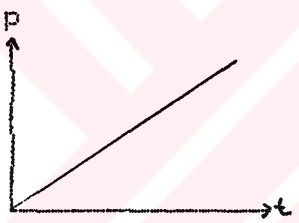
d) Yol

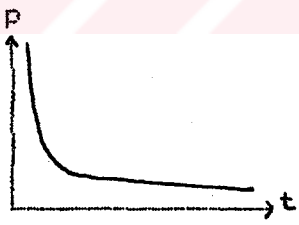
e) Kütle

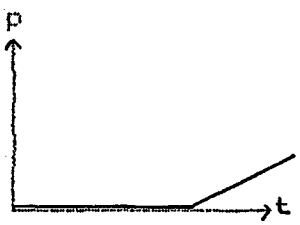
19. Sabit bir kuvvet etkisindeki cismin momentumu zamanla nasıl değişir?

a) 

b) 

c) 

d) 

e) 

20. Aşağıdakilerden hangisi momentum değişimine eşittir?

a) $m.v$

b) $\Delta m.v$

(c) $F.\Delta t$

d) $\Delta F.t$

e) $m.a$

FIZIK ÖN-TEST PARALELİ

1. Birim zamanda alınan yol aşağıdakilerden hangisini tanımlar?

   a) İvme

   (b) Hız

   c) Kuvvet

   d) Moment

   e) Kütle

2. Hızın zamana göre 1. türevi neyi tanımlar?

   (a) İvme

   b) Hız

   c) Kuvvet

   d) Moment

   e) Hareket

3. Aşağıdakilerden hangisi ivme birimidir?

   a) $m.sn^{-1}$

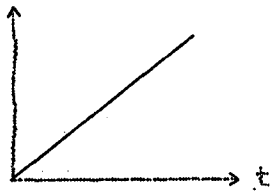
   b) $m.sn$

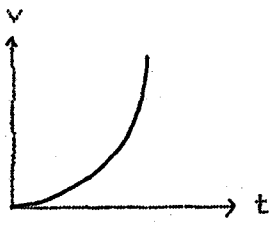
   (c) $m.sn^{-2}$

   d) $\frac{kg}{Newton}$

   e) Newton

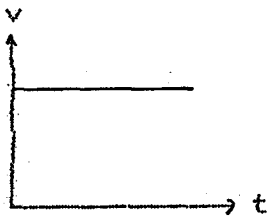
4. Hava direnci gözönüne alınınca serbest düşmede hız zaman grafiği aşağıdakilerden hangisi olabilir?

a) 

b) 

c) 

(d) 

e) 

5. $s=3t-1$ ile yol ifadesi verilen cismin hızı aşağıdakilerden hangisidir?

(a) 3

b) -1

c) 2

d) -3

e) 4

6. $s=4t^2-3t$ ile yol ifadesi verilen cismin ivmesi aşağıdakilerden hangisidir?

a) 4

b) 6

(c) 8

d) -3

e) 1

7. 10 $m/_{sn}$ hızla giden cisim 2 $m/_{sn^2}$ ivme ile frenlerse kaç sn sonra durur?

a) 2

b) 3

c) 4

(d) 5

e) 6

8. 7 inci soruda cisim kaç m yol aldıktan sonra durur?

a) 10

b) 20

(c) 25

d) 50

e) 45

9. 800 kg araba frenleyerek 2 $m/_{sn^2}$ ivme ile duruyor. Fren kuvveti kaç Newtondur?

(a) 1600

b) 800

c) 400

d) 160

e) 3200

10. 500 m yüksekten bırakılan 1 kg demir ve 1 kg pamuk paketi serbest düşmeye bırakılsa (hava direnci önemsenmiyor) hangisi önce yere düşer?

a) Pamuk

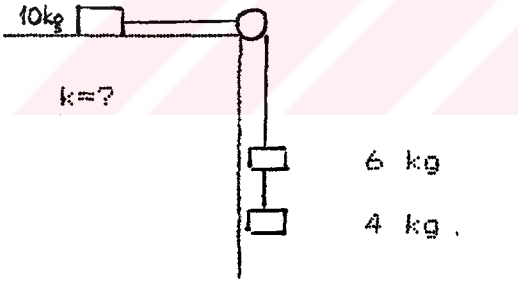
b) Demir

(c) Her ikisinde aynı zamanda

d) Verilen yetersiz

e) Yer çekimine göre değişir

11.



Sistem bırakıldıktan 4 sn sonra 4 kg kütle kopunca cisim düzgün doğrusal hareket yapıyor. Sürtünme katsayısı nedir?

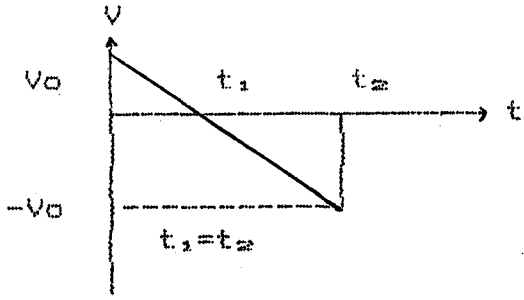
a) 0,4

b) 0,5

(c) 0,6

d) 0,7

e) 0,8

12. 

Yandaki şekil hangi atışın hız zaman grafiğidir?

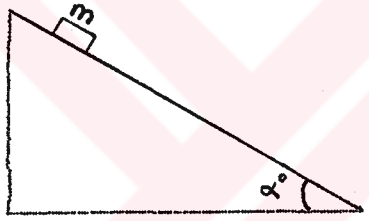
a) Serbest düşme

b) Yukarıdan aşağı düşey atış

c) Eğik atış

(d) Aşağıdan yukarı düşey atış

e) Yatay atış

13. 

m=10kg
α=30°

Eğik düzlemdeki bir cisim kendi haline bırakılıyor. k=0 ise hareketin ivmesi nedir?

(a) g.sinα

b) mg.Sinα

c) 6

d) 0

e) 10

14. Eğik atış hareketinde aşağidakilerden hangisi sabittir?

a) Hız

(b) Hızın yatay bileşeni

c) Hızın yönü

d) Hızın düşey bileşeni

e) Hız vektörünün yönü

15. Esnek olmadan çarpışan iki cismin çarpışma öncesi momentumlarının vektörel toplamı sıfırdır. Çarpışma sonrası hızları nedir?

(a) Dururlar

b) Büyük kütlenin hızıyla giderler

c) Küçük kütlenin hızıyla giderler

d) Hızlarını değişirler

e) Kesin bir şey söylenemez

16. Düşey düzlemde düzgün dairesel hareket yapan cismin düşmemesi için gereken minimum hız kaç $m/_{sn}$ dir? ($r=40m$, $g=10\ m/_{sn^2}$)

(a) 20

b) 400

c) 40

d) 4

e) 10

17. Aşağıdakilerden hangisi dairesel harekette merkezcil ivme formülüdür?

(a) $\frac{v^2}{r}$

b) $\frac{r}{v^2}$

c) r^2w

d) $\frac{w}{r^2}$

e) $v^2.r$

18. Momentum değişiği aşağıdakilerden hangisine eşittir?

a) $\Delta m.v$

(b) $F.\Delta t$

c) $m.\Delta v$

d) $m.v$

e) $F.m$

19. Eğik atılan cisimler tepe noktasına geldiklerinde hızları için aşağidakilerden hangisi doğrudur?

a) Hız sıfırdır.

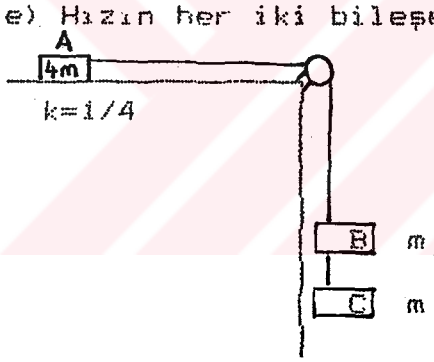
b) Hızın yatay bileşeni sıfırdır.

(c) Hızın düşey bileşeni sıfırdır.

d) Hız maxsimum değerdedir.

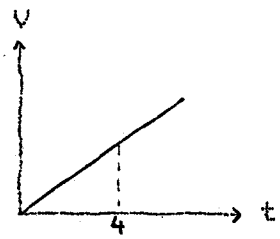
e) Hızın her iki bileşeni de sıfırdır.

20.

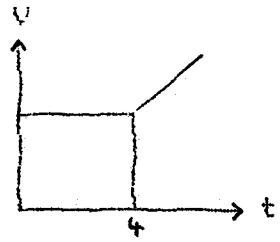


t=4 sn sonra BC ipi koparsa sistemin hız zaman grafiği hangisidir?

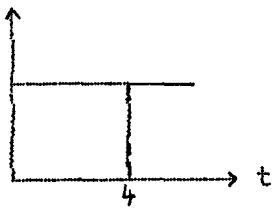
a)



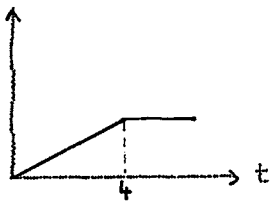
b)



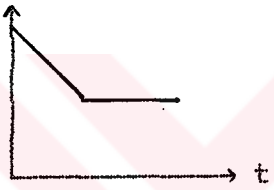
c) V



(d) V



e) V



SUBJECT AREA: PHYSICS

There were 5 learning units to be covered for Physics in the second semester of the 11th grade curriculum.

Unit 7 : Newtonian Law of Gravitation

Unit 8 : Wave Motion

Unit 9 : Sound

Unit 10 : Induction

Unit 11 : Alternative Currents

In Physics, each unit constituted a learning task by itself. The 5 learning units were chosen from the textbook, Fizik Lise: III Fen by Reşat Otman, published by İnkilâp ve Aka Limited 1967.

I. ÖĞRENME BİRİMİ: NEWTON GENEL ÇEKİM KANUNU

Öğrenme Hedefleri:

1. Öğrenciler Newton'un Genel Çekim Kanunu tanımını verilen tanımlar arasından seçebilmelidirler.

2. Öğrenciler Newton'un Genel Çekim Kanunu formülünü verilen formüller arasından seçebilmelidirler.

3. Öğrenciler Newton'un Genel Çekim Kanunu formülünde kullanılan birimleri verilen çeşitli birimler arasından seçebilmelidirler.

4. Öğrenciler Newton'un Genel Çekim kanunundaki genel çekim kuvvetini ağırlık ve yerin çekim ivmesi ile oranlayabilmelidirler.

5. Öğrenciler iki kütlenin birbirine uyguladığı evrensel çekim kuvvetleri arasındaki ilişkiyi belirleyebilmelidirler.

6. Öğrenciler Newton'un Genel Çekim formülünü kullanarak iki cisim arasındaki çekim kuvvetini hesaplayabilmelidirler.

7. Öğrenciler Newton'un Genel Çekim formülünü kullanarak yer kütlesini hesaplayabilmelidirler.

8. Öğrenciler Newton'un Genel Çekim formülünü kullanarak güneş kütlesini hesaplayabilmelidirler.

9. Öğrenciler Newton'un Genel Çekim formülünden faydalanarak çekim ivmesinin yükseklikle değişimini hesaplayabilmelidirler.

10. Öğrenciler Newton'un Genel Çekim formülünden faydalanarak bir cismin ağırlığının yükseklikle değişimini hesaplayabilmelidirler.

11. Öğrenciler farklı ortamlar için Newton'un Genel Çekim formülünü kullanarak ivme ve ağırlık değişimlerini hesaplayabilmelidirler.

12. Öğrenciler Newton'un Genel Çekim kanununu kullanarak farklı durumlarda ivme ve ağırlık oranlarını hesaplayabilmelidirler.

13. Öğrenciler bir cismin ağırlığının enlemle değişimini hesaplayabilmelidirler.

14. Öğrenciler bir cismin çekim ivmesinin enlemle değişimini hesaplayabilmelidirler.

15. Öğrenciler verilen ifadeler arasından Kepler'in kanunlarını içeren üç ifadeyi belirleyebilmelidirler.

16. Öğrenciler Kepler'in peryodları formülünü kullanarak verilen bir problemi çözebilmelidirler.

17. Öğrenciler sarkaç prensiplerini içeren matematiksel formülü verilen formüller arasından seçebilmelidirler.

18. Öğrenciler sarkaç formülünden yararlanarak bir sarkaçın peryodunu, uzunluğunu veya yerçekimi ivmesini hesaplayabilmelidirler.

19. Öğrenciler sarkaç formülünden yararlanarak çekim ivmesinin farklı olduğu ortamlar için peryoddaki değişmeyi hesaplayabilmelidirler.

II. ÖĞRENME BİRİMİ: DALGA HAREKETİ

Öğrenme Hedefleri:

1. Öğrenciler bir hareketin şekil değişikliğinin enine atma türü olduğunu verilenler arasından seçebilmelidirler.

2. Öğrenciler bir hareketin şekil değişikliğinin boyuna atma türü olduğunu verilenler arasından seçmelidirler.

3. Öğrenciler dalga hareketinde dalga boyunu verilen tanımlar arasından belirleyebilmelidirler.

4. Öğrenciler dalga hareketinde frekans, dalga boyu, hız ve peryot arasındaki ilişkiyi belirleyebilmelidirler.

5. Öğrenciler dalga hareketinde frekans, dalga boyu, hız ve peryot değişkenlerini içeren matematiksel formülü verilen formüller arasından seçebilmelidirler.

6. Öğrenciler dalga hareketinde frekans, dalga boyu, hız ve peryot degişkenlerinin birimlerinden sorulan herhangi birinin birimini verilen birimler arasından seçebilmelidirler.

7. Öğrenciler dalga hareketinde frekans, dalga boyu, hız ve peryot değişkenlerinden herhangi birini hesaplayabil-melidirler.

8. Öğrenciler Huygens prensibinin tanımini verilen tanımlar arasından seçebilmelidirler.

9. Öğrenciler verilen matematikseel ifadeler arasından sinüzoidal bir dalga denklemini seçebilmelidirler.

10. Öğrenciler genlik, peryot, frekans, yayilma hizi veya titreşim kaynağından olan uzaklıği verilen bir dalganin hareket denklemini oluşturabilmelidirler.

11. Öğrenciler sinüzoidal bir dalga denklemini kullanarak genlik, dalga boyu, yayılma hızı, titreşim kaynağından olan uzaklık, peryod, frekans, ve faz farkı değişkenlerinden herhangi biri/birkaçını hesaplayabilmelidirler.

12. Öğrenciler Huyghens prensibine gore dalgaların kirilması olayını açıklayan ifadeyi belirleyebilmelidirler.

13. Öğrenciler Huyghens prensibini kullanarak yansıma olayında atmanın gelme ve yansima açilarini hesaplayabilmelidirler.

14. Öğrenciler Descartes formülünü kullanarak ortamların birbirine göre kirilma indisini hesaplayabilmelidirler.

15. Öğrenciler verilen bir girişim olayinin sağlanması için gerekli degişiklikleri ya da koşullari belirleyebilmelidirler.

16. Öğrenciler maksimum genlikte titreşen ve hiç titreşmeyen noktaların kaynaklara olan uzaklık farkını ya da dalga boyunu hesaplayabilmelidirler.

17. Öğrenciler duraklı dalga tanımını verilenler arasından seçebilmelidirler.

18. Öğrenciler karın ve düğüm noktalarının yerlerini belirleyen formülü kullanarak karın ve düğüm noktalarının sayılarını hesaplayabilmelidirler.

19. Öğrenciler vuruyu tanımlayabilmelidirler.

20. Öğrenciler vurulu titreşim formülünü kullanarak vuruların frekansını hesaplayabilmelidirler.

21. Öğrenciler rezonansı tanımlayabilmelidirler.

III. ÖĞRENME BİRİMİ: SES

Öğrenme Hedefleri:

1. Öğrenciler ses titreşiminin özelliklerini verilen özellikler arasından ayırdedebilmelidirler.

2. Öğrenciler bir titreşimin ses olarak duyulabilmesi için gerekli sınırları belirleyebilmelidirler.

3. Öğrenciler ses dalgalarının hangi ortamda yayıldığını belirleyebilmelidirler.

4. Öğrenciler ses hızını König Trombon Metoduna göre hesaplayabilmelidirler.

5. Öğrenciler sesin gazlar içindeki yayılma hızının nelere bağlı olduğunu belirleyebilmelidirler.

6. Öğrenciler sesin gazlar içinde yayılma hızı formülünü kullanarak sesin bu ortamdaki yayılma hızını hesaplayabilmelidirler.

7. Öğrenciler sesin katı ve sıvılar içinde yayılma hızının nelere bağlı olduğunu belirleyebilmelidirler.

8. Öğrenciler sesin katı ve sıvılar içinde yayılma hızı formülünü kullanarak sesin bu ortamlar içindeki yayılma hızını ve esneklik modüllerini hesaplayabilmelidirler.

9. Öğrenciler bir titreşen telin frekansının bağlı olduğu değişkenleri içeren ifadeyi verilenler arasından seçebilmelidirler.

10. Öğrenciler titreşen tel kanunları ile ilgili ifadelerden doğru olanını verilenler arasından seçebilmelidirler.

11. Öğrenciler titreşen tel formülünü kullanarak bu formüldeki frekans, telin uzunluğu, germe kuvveti, boyca yoğunluk değişkenlerinden sorulan birini hesaplayabilmelidirler.

12. Öğrenciler ana sesin frekansından faydalanarak armoniklerinin frekansını bulabilmelidirler.

13. Öğrenciler sesin fizyolojik özellikleri olan şiddet, yükseklik ve tını ile ilgili ifadeler arasından doğru olanını seçebilmelidirler.

14. Öğrenciler siren prensibinden faydalanarak meydana gelen sesin dalga boyunu veya sirenin devrini hesaplayabilmelidirler.

15. Öğrenciler açık ve kapalı ses boruları ve armoniklerinin özelliklerini içeren doğru ifadeyi verilenler arasından seçebilmelidirler.

16. Öğrenciler kapali ses boruları özelliklerini kullanarak boruların uzunluğunu veya sesin dalga boyunu hesaplayabilmelidirler.

17. Öğrenciler açık ses boruları özelliklerini kullanarak boruların uzunluğunu veya sesin dalga boyunu hesaplayabilmelidirler.

IV. ÖĞRENME BİRİMİ: İNDÜKSİYON

Öğrenme Hedefleri:

1. Öğrenciler indüksiyon akımının elde edilişi ile ilgili kanunların tanımini verilen ifadeler arasından seçebilmelidirler.

2. Öğrenciler verilen tanımlar arasından Lenz kanunu ile ilgili tanımı seçebilmelidirler.

3. Öğrenciler bir sarımdan geçen manyetik akımın değişme miktarı, manyetik akımın değişme süresi ve makaranın sarım sayısı verildiğinde elektromotor kuvvetini (e.m.k.) hesaplayabilmelidirler.

4. Öğrenciler manyetik akının zamana bağlı olarak denklemi verildiğinde belli bir zaman içindeki elektromotor kuvvetini hesaplayabilmelidirler.

5. Öğrenciler zamana bağlı elektromotor kuvveti ve telin direncinden faydalanarak telden geçen akım şiddetini hesaplayabilmelidirler.

6. Öğrenciler bir devrenin self (Öz)-indüksiyon elektromotor kuvvetini hesaplayabilmelidirler.

7. Öğrenciler bir devrenin self-indüksiyon katsayısını hesaplayabilmelidirler.

8. Öğrenciler bir devrenin kapanma ve açılma anlarındaki self-indüksiyon elektromotor kuvvetlerine ait akım-zaman grafiğini verilenler arasından seçebilmelidirler.

V. ÖĞRENME BİRİMİ: ALTERNATİF AKIM

Öğrenme Hedefleri:

1. Öğrenciler bir devredeki maksimum elektromotor kuvveti, frekans ve/veya periyot değerleri verildiğinde o devrenin

herhangi bir andaki elektromotor kuvvetinin denklemini oluşturabilmelidirler.

2. Öğrenciler direnci R kadar olan kapalı bir devrede maksimum akım değeri verildiği zaman o devredeki akım şiddetinin ani değerini veren denklemi oluşturabilmelidirler.

3. Öğrenciler direnci R kadar olan kapalı bir devrede maksimum potansiyal farkı verildiği zaman potansiyal farkının ani değerini veren denklemlerden faydalanarak peryot, frekans veya pulsasyon değişkenlerinden birini hesaplayabilmelidirler.

4. Öğrenciler etkin değeri şiddet ve potansiyal açısından tanımlayabılmelidirler.

5. Öğrenciler etkin değerlerle maksimum değerleri arasındaki ilişkiyi kullanarak etkin akım şiddetini belirleyebilmelidirler.

6. Öğrenciler potansiyal farkı ile akım şiddeti arasındaki faz farkını hesaplayabilmelidirler.

7. Öğrenciler indüktans L Henry olan bir bobinde oluşan indükleme direncini hesaplayabilmelidirler.

8. Öğrenciler seri bir RL devresinin empedansını hesaplayabilmelidirler.

9. Öğrenciler sığası C farat olan bir kondansatörün indükleme direncini hesaplayabilmelidirler.

10. Öğrenciler seri bağlı kondansatörlerden oluşan bir devrenin empedansını hesaplayabilmelidirler.

11. Öğrenciler paralel bağlı kondansatörlerden oluşan bir devrenin empedansını hesaplayabilmelidirler.

12. Öğrenciler seri RCL devresinin empedansını hesaplayabilmelidirler.

13. Öğrenciler verilen bir alternatif akım devresinde güç çarpanını hesaplayabilmelidirler.

14. Öğrenciler verilen bir alternatif akım devresinde bir parçada harcanan veya hasil olan ortalama gücü hesaplayabilmelidirler.

15. Öğrenciler paralel RCL devresinde dirençten, kondansatörden ve makaradan geçen akimları hesaplayabilmelidirler.

16. Öğrenciler paralel RCL devresinde anakol (anahat) akımını hesaplayabilmelidirler.

17. Öğrenciler verilen bir alternatif akım devresinde rezonans durumundaki rezonans farkını hesaplayabilmelidirler.

I. ÖĞRENME BİRİMİ: NEWTON'UN GENEL ÇEKİM KANUNU

İZLEME TESTİ I A

1. Aşağıdaki ifadelerden hangisi Newton'un genel çekim kanununu tanımlar?

   a) İki cisim arasındaki çekim kuvveti bunların kütleleri ve aralarındaki uzaklığın karesi ile ters orantılıdır.

   b) İki cisim arasındaki çekim kuvveti bunların kütleleri ile doğru, aralarındaki uzaklık ile ters orantılıdır.

   (c) İki cisim arasındaki çekim kuvveti bunların kütleleri ile doğru, aralarındaki uzaklığın karesi ile ters orantılıdır.

   d) İki cisim arasındaki çekim kuvveti bunların kütlelerinin karesi ile doğru, aralarındaki uzaklık ile ters orantılıdır.

   e) İki cisim arasındaki çekim kuvveti bunların kütleleri ve aralarındaki uzaklığın karesi ile doğru orantılıdır.

2. Kütlelri eşit ve aralıklarındaki uzaklık d olan iki cismin aralarındaki çekim kuvveti hakkında aşağıdakilerden hangisi söylenebilir?

   a) $F=k.\frac{m}{d}$

   (b) $F=k.\frac{m^2}{d^2}$

   c) $F=k.\frac{m}{d^2}$

   d) $F=k.\frac{m^2}{d}$

   e) $F=k.\frac{m^2}{d^3}$

3. Aşağıdakilerden hangisi Newton'un genel çekim formülündeki k sabitinin birimi olabilir?

   a) $\frac{dyn.cm}{gr\text{-}kût^2}$

   b) $\frac{dyn.cm}{gr\text{-}kût}$

   c) $cm^2/s^2g\text{-}kût$

   d) $cm^3/s^2\text{-}kût$

   (e) $dyn.cm^2/gr.kût^2$

4. G evrensel çekim sabiti, r yerin yarıçapı, M yerin kütlesi ve g de yerin çekim ivmesi olduğuna göre G/g oranı aşağıdakilerden hangisine eşittir?

   a) $\frac{M}{r^2}$

   (b) $\frac{r^2}{M}$

   c) $\frac{M^2}{r^2}$

   d) $\frac{r^2}{M^2}$

   e) Mr^2

5. Dünya - Ay Sisteminde, dünyanın kütlesi, ayın kütlesinin 81 katıdır. Dünyanın aya uyguladığı F_d ve ayın dünyaya uyguladığı F_a "Evrensel Çekim" kuvvetleri arasındaki ilişki için aşağıdakilerden hangisi doğrudur?

   a) $F_d = 81\ F_a$

   b) $F_d = F_a$

   (c) $F_d = -F_a$

   d) $F_d = -81\ F_a$

   e) $F_d = -9\ F_a$

6. Ağırlıkları 2 ve 1/2 kg olan iki kürenin merkezleri arasındaki uzaklık 10 cm iken birbirlerine yaptıkları çekim kuvveti kaç dyn.'dir? ($k=6,7\times10^{-8}$ alınacaktır.)

   a) $6,7.10^{-2}$

   b) $6,7.10^{-3}$

   (c) $6,7.10^{-4}$

   d) $6,7.10^{-5}$

   e) $6,7.10^{-6}$

7. Yeryüzünün yarıçapı R olarak alınırsa, aşağıdakilerden hangisi yer kütlesine eşittir?

   a) $\frac{gR}{k}$

   b) $\frac{gk}{R}$

   c) gR

   (d) $\frac{gR^2}{k}$

   e $\frac{gk}{R^2}$

8. Dünyanın güneşe olan uzaklığı d ve güneş etrafındaki devir süresi T ise, güneş kütlesi aşağıdakilerden hangisine eşittir?

a) $\frac{2\pi^2 d^2}{T^2 k}$

(b) $\frac{4\pi^2 d^3}{T^2 k}$

c) $\frac{4\pi^2 d}{T^2 k}$

d) $\frac{\pi^2 d^2}{Tk}$

e) $\frac{4\pi^2 d^2}{Tk}$

9. Yerçekimi ivmesinin 980 $cm/_{sn^2}$ olduğu bir yerde kaç metre yükseğe çıkarılırsa yerçekimi ivmesi 979 $cm/_{sn^2}$ olur? (R=6400 km)

(a) 3200 m

b) 6400 m

c) 1600 m

d) 3600 m

e) 12800 m

10. Bir cismin dünya üzerindeki ağırlığı 90 kg'dir. Bu cismin dünya yüzeyinden 1000 mil yükseklikteki ağırlığı kaç kg'dir?

a) 60

b) 75

(c) 45

d) 90

e) 135

11. Bir gezegenin kütlesi yer kütlesinin 1/9'u ve yarıçapı da yer yarıçapının yarısıdır. Dünyada 9 kg gelen bir cisim gezegende kaç kg gelir?

a) 4/9 kg

b) 2 kg

c) 9/4 kg

d) 9 kg

(e) 4 kg

12. Merihin kütlesi dünyanin kütlesinin onda biri ve merihin yarıçapı yarısı olduğuna göre merih üzerindeki yerçekiminin ivmesi, dünya üzerindeki yerçekimi ivmesinin kaç katıdır?

a) 0.2

b) 2

(c) 0.4

d) 2.5

e) 4

13. Kutuplarda 27 kg gelen bir cismin ekvatordaki ağırlığı ne olur?

a) 27 kg'dan fazla

b) 27 kg

c) 54 kg

(d) 27 kg'dan az

e) 54 kg'dan fazla

14. Ekvatorda çekim ivmesi g=978 $cm/_{sn^2}$'dir. Yer dönmeseydi bu ivme ne kadar olurdu? ($R=6,3x10^6$ alınacaktır.)

a) 978 $cm/_{sn^2}$

b) 987 $cm/_{sn^2}$

c) 980 $cm/_{sn^2}$

d) 979 $cm/_{sn^2}$

(e) 982 $cm/_{sn^2}$

15. Aşağıdaki ifadelerden hangisi Kepler'in üç kanununu içerir?

a) Gezegenlerin yörüngeleri odaklarından birinde güneş bulunan birer elipstir.

Herhangi bir gezegeni güneşe birleştiren vektör eşit zamanlarda eşit alanlar süpürür.

Bir cismin ağırlığı dünya üzerinde bulunduğu yere göre değişir.

b) Gezegenlerin yörüngeleri odaklarından birinde güneş bulunan birer elipstir.

Herhangi bir gezegeni güneşe birleştiren vektör eşit zamanlarda eşit alanlar süpürür.

Bir gezegen uydusunu ne kadarlık bir kuvvetle çekerse, uydu da gezegeni aynı büyüklükte fakat zıt yönlü bir kuvvetle çeker.

c) Gezegenlerin yörüngeleri odaklarından birinde güneş bulunan birer elipstir.

Bir cismin ağırlığı dünya üzerindeki bulunduğu yere göre değişir.

Bir gezegen uydusunu ne kadarlık bir kuvvetle çekerse, uydu da gezegeni aynı büyüklükte fakat zıt yönlü bir kuvvetle çeker.

d) Gezegenlerin yörüngeleri odaklarından birinde güneş bulunan birer elipstir.

Bir cismin ağırlığı dünya üzerindeki bulunduğu yere göre değişir.

Gezegenlerin güneş etrafındaki devir sürelerinin kareleri, bunların güneşe olan ortalama uzaklıklarının küpleri ile orantılıdır.

(e) Gezegenlerin yörüngeleri odaklarından birinde güneş bulunan birer elipstir.

Herhangi bir gezegeni güneşe birleştiren vektör eşit zamanlarda eşit alanlar süpürür.

Gezegenlerin güneş etrafındaki devir sürelerinin kareleri, bunların güneşe olan ortalama uzaklıklarının küpleri ile orantılıdır.

16. Bir A gezegeninin peryodu, B gezegeninin peryodunun 8 katıdır. A'nın ortalama yörünge çapı B'ninkinin kaç katıdır?

(a) 4

b) 1/4

c) 8

d) 1/8

e) 64

17. Bir sarkaçın uzunluğu l ve yerçekimi ivmesi g olduğuna göre bu sarkaçın peryodu aşağıdakilerden hangisine eşittir?

a) $\pi\frac{\sqrt{l}}{\sqrt{g}}$

(b) $2\pi\frac{\sqrt{l}}{\sqrt{g}}$

c) $g\frac{\sqrt{2\pi}}{\sqrt{l}}$

d) $g\frac{\sqrt{l}}{\sqrt{2\pi}}$

e) $2\pi\frac{\sqrt{l}}{\sqrt{g}}$

18. Uzunluğu 99.4 cm olan bir sarkaç 10 sn'de 20 tam salınım yapıyor. Sarkaçın bulunduğu yerdeki çekim ivmesi kaç $cm/_{sn^2}$'dir? ($g=980\ cm/_{sn^2}$)

a) 970

b) 1960

c) 490

(d) 980

e) 245

19. Dünya yüzeyindeki peryodu 2 sn olan bir sarkaçın çekim ivmesi 2.43 $m/_{sn^2}$ olan bir gezegendeki peryodu kaç sn'dir? (Dünyanın çekim ivmesi 9.8 $m/_{sn^2}$'dir)

a) 8 sn

b) 16 sn

(c) 4 sn

d) 32 sn

e) 2 sn

II. ÖĞRENME BİRİMİ: DALGA HAREKETİ

İZLEME TESTİ II A

1. Durgun su yüzünde yayılan bir atmanın hareketi nasıl bir atma örneğidir?

   (a) Enine atma

   b) Boyuna atma

   c) Hem enine, hem boyuna atma

   d) Küresel atma

   e) Yüzeysel atma

2. Bir ucuna bir kütle bağlanarak, bir çiviye asılmış serbest bir sarmal yay, kendi doğrultusunda sıkıştırılıp bırakılırsa titreşmeye başlar. Bu sarmal yaydaki hareket nasıl bir dalga (atma) örneğidir?

   a) Enine atma

   (b) Boyuna atma

   c) Hem enine, hem boyuna atma

   d) Küresel atma

   e) Yüzeysel atma

3. Aşağıdakilerden hangisi dalga boyunu tanımlar?

   a) Dalga tepesi ile dalga çukuru arasındakı uzaklık

   b) Dalgaların başlangiç ve bitim noktası arası uzaklık

   (c) Ardışık iki dalga tepesi veya dalga çukuru arasındaki uzaklık

   d) Su seviyesi ile dalga tepesi veya dalga çukuru arasındáki uzaklık

   e) Su seviyesinden dibe olan uzaklık

4. Aşağıdaki ifadelerden hangisi doğrudur?
(λ:Dalga Boyu, T:Periyot, f:Frekans, v:Hız)

a) λ ile v ters orantılıdır.

b) λ ile T ters orantılıdır.

c) T ile f doğru orantılıdır.

(d) T ile f ters orantılıdır.

e) λ ile f doğru orantılıdır.

5. Aşağıdaki matematiksel ifadelerden hangisi doğrudur?

a) $T = f^2$

b) $\lambda = \frac{V}{T}$

c) $\lambda = v.f$

(d) $T.f = 1$

e) $\lambda = T.f$

6. Dalga boğu (cm) ve hız (cm/$_{sn}$) olarak verildiğine göre aşağıdakilerden hangisi frekansın birimidir?

a) cm

b) cm/$_{sn}$

c) sn

(d) 1/$_{sn}$

e) 1/$_{sn^2}$

7. Saniyede 400000 salınım yapan bir radyo dalgasının dalga boyu km olarak aşağıdakilerden hangisidir?
(Işık hızı: 300000 km)

a) 0,075

(b) 0,75

c) 7,5

d) 1

e) 10

8. Aşağıdaki ifadelerden hangisi Huyghens prensibini tanımlar?

(a) Bir dalga merkezinden çıkan dalgalar yayıldıkları ortam içinde vardıkları her noktaya genliği ve peryodu dalga merkezi kadar olan, fakat ona nazaran bir faz farkı gösteren yeni bir dalga merkezi haline getirirler.

b) dalganın bir peryotluk zamanda aldığı yoldur.

c) Aynı bir noktaya aynı anda iki veya daha fazla dalganın gelmesiyle meydana gelen olaydır.

d) Öyle noktalar vardır ki iki dalgayı aynı fazda alırlar ve bir dalganinkinden iki kat büyük bir genlikle titreşirler.

e) Dalgaların, 1 tam titreşim süresinde aldıkları yoldur.

9. Aşağıda verilen denklemlerden hangisi sinüzoidal dalga denkleminin matematiksel ifadesidir?

a) $y=r\sin\left(\frac{t}{T}-\frac{x}{\lambda}\right)$

b) $y=r\sin 2\pi\left(\frac{t}{\lambda}-\frac{x}{T}\right)$

c) $y=r\sin\frac{2\pi}{T}\left(\frac{t}{T}-\frac{x}{\lambda}\right)$

d) $y=r\sin\frac{2\pi}{T}\frac{x}{\lambda}$

(e) $y=r\sin 2\pi\left(\frac{t}{T}-\frac{x}{\lambda}\right)$

10. Genliği 2 mm. frekansı ise 50 ($1/_{sn}$) olan bir titreşim kaynağı bir lastik kordon üzerinde 15 $cm/_{sn}$ hızla ilerleyen enine bir dalga yayıyor. Titreşim kaynağından 60 cm uzakta bulunan bir noktanın titreşim denklemi aşağıdakilerden hangisidir?

a) $y=0,2\sin 50\pi(t-4)$

b) $y=0,1\sin 50\pi(t-4)$

c) $y=0,2\sin 2\pi(t-4)$

(d) $y=0,2\sin 100\pi(t-4)$

e) $y=0,1\sin 100\pi(t-4)$

11. Bir dalga merkezinden çikan dalgaların kaynaktan x kadar uzakta bulunan p noktasındaki hareket denklemi CGS birimleriyle $Yp=40\sin\pi(2t-x)$ bağıntısıyla veriliyor. Genlik, dalga boyu ve yayılma hızı sırasıyla aşağıdakilerden hangisidir?

(a) (40,2,2)

b) (40,1,2)

c) (40,2,1)

d) (40,1,1)

e) (40,1,1/2)

12. Düzlem dalgaların V_1 hızı yayıldıkları bir ortamdan V_2 hızı ile yayılacakları ikinci bir ortama vardıklarını düşünelim. α geliş açısını, β kırılma açısını gösterirse aşağıdaki ifadelerden hangisi doğrudur?

a) $\dfrac{\text{Sin } \alpha}{\text{Sin } \beta} = \left(\dfrac{V_1}{V_2}\right)^2$

(b) $\dfrac{\text{Sin } \alpha}{\text{Sin } \beta} = \dfrac{V_1}{V_2}$

c) $\dfrac{\text{Sin } \alpha}{\text{Sin } \beta} = \dfrac{V_2}{V_1}$

d) $\dfrac{\text{Sin } \alpha}{\text{Sin }} = \left(\dfrac{V_2}{Vi}\right)^2$

e) $\dfrac{\text{Sin } \alpha}{\text{Sin } \beta} = \left(\dfrac{V_1}{V_2}\right)^{1/2}$

13. Doğrusal bir atma düz bir engelde yansımaktadır. Engel bir A açısı kadar dönerse, yansıyan atmanın dalga yüzü ne kadar sapar?

(a) 2 A

b) A

c) 90-A

d) $\dfrac{90-A}{2}$

e) A/2

14. Doğrusal bir su dalgası, düz bir sınırda birdenbire derinleşen ortamın sığ kısımından derin kısmına geçiyor. Sığ kısımdaki dalga boyu λ_s ve derin kısımdaki dalga boyu da λ_d dir. Derin kısmın sığ kısma göre kırılma indisinin değeri ne olur?

(a) $\dfrac{\lambda_s}{\lambda_d}$

b) $\dfrac{\lambda_d}{\lambda_s}$

c) $\dfrac{\lambda_s}{\lambda_s+\lambda_d}$

d) $\dfrac{\lambda_d}{\lambda_s+\lambda_d}$

e) $\dfrac{\lambda_s-\lambda_d}{\lambda_s+\lambda_d}$

15. İki dalga kaynağı ile girişim elde edebilmek için aşağıdaki koşullardan hangisi sağlanmış olmalıdır?

a) İki atmanın dalga boyu eşit olmalıdır.

b) İki atma, ortamda aynı hızla yayılmaktadır.

c) İki atma, aynı peryotlu olmalıdır.

d) İki atma, aynı fazda olmalıdır.

(e) İki atma, yayılma ortamında kesişmelidir.

16. Kaynaklara olan uzaklıkları farkı (x_2-x_1) olan noktaların maksimum genlikte titreşebilmesi için $\cos \pi (x_2-x_1/\lambda)=1$ denklemi verilmektedir. Buna göre kaynaklara olan uzaklıkları farkı aşağıdakilerden hangisidir?

a) $(2k+1)\ \frac{\lambda}{3}$

(b) $k\lambda$

c) $(2k+1)\ \frac{\lambda}{2}$

d) $(2k-1)\ \frac{\lambda}{3}$

e) $(2k-1)\ \frac{\lambda}{2}$

17. Aşağıdakilerden hangisi duraklı dalgayı tanımlar?

a) Hareketsiz dalgalardır.

b) İki dalganın girişimine denir.

(c) Giden ve yansıyan dalgaların girişimi sonucunda meydana gelen dalga sistemine denir.

d) Titreşim doğrultusu yayılma doğrultusuna dik olan dalgalara denir.

e) Titreşim doğrultusu yayılma doğrultusunda olan dalgalara denir.

18. Yayılma hızı $3m/_{sn}$ olan dalgalar sert bir engelde yansıyarak kararlı dalgalar oluşturuyorlar. Kaynağın frekansı $100\ 1/_{sn}$ ise 6 cm uzunlukta kaç düğüm ve kaç karın noktası vardır?

(a) 5 düğüm, 4 karın noktası

b) 4 düğüm, 5 karın noktası

c) 4 düğüm, 4 karın noktası

d) 4 düğüm, 5 karın noktası

e) 2 düğüm, 3 karın noktası

19. Aşağıdaki olaylardan hangisi vuru'yu tanımlar?

(a) Aynı anda ses veren iki kaynağın frekansları birbirinden biraz farklı olursa, duyulan sesin frekansında azalma ve çoğalma olur.

b) Ayrı ayrı ses veren iki kaynağın frekansları birbirinden biraz farklı olursa, duyulan sesin frekansında azalma ve çoğalma olur.

c) Ayrı ayrı ses veren iki kaynağın frekansları birbiriyle aynı olursa duyulan sesin frekansında değişme olmaz.

d) Aynı anda ses veren iki kaynağın yayılma hızları birbiriyle aynı olursa, duyulan sesin frekansında azalma ve çoğalma olur.

e) Aynı anda ses veren iki kaynağın frekansları birbirleriyle aynı olursa, duyulan sesin frekansında azalma ve çoğalma olur.

20. Aynı anda titreştirilen iki titreşim kaynağından çıkan ses dalgalarının boyları 12 cm ve 11,9 cm.dir. Sesin yayılma hızı 340 m/sn olduğuna göre, saniyede kaç vuru meydana gelir?

a) 20
b) 23
(c) 25
d) 30
e) 32

21. Aşağıdakilerden hangisi rezonans'in tanimidir?

a) Birleşik bir titreşimde, genliğin peryotlu olarak azalıp çoğalması olayına denir.

b) İki dalgayı, zıt fazlı olarak alan ve titreşmeyen bir noktadır.

(c) Salınım yapabilen bir sistem, salınımlarının peryoduna eşit aralarla, aynı yönlü küçük etkiler alacak olursa, büyük genlikli titreşimler yapabilir. Buna rezonans denir.

d) Titreşimleri kolay sönümlenen bir rezonatöre peryodu kendisininkinden çok değişik titreşimler de yaptırabilir. Buna rezonans denir.

e) Aynı noktaya aynı anda gelen iki dalganın bu noktada meydana getirdikleri olaya denir.

III. ÖĞRENME BİRİMİ: SES

İZLEME TESTİ III A

1. Sesin titreşimi ile ilgili aşağıdaki ifadelerden hangisi doğrudur?

   a) Ses boşlukta da yayılır.

   b) Ses değişik ortamlarda da aynı hızla yayılır.

   c) Ses dalgaları enine dalgalardır.

   d) Frekansı ne olursa olsun bütün sesler kulağımız tarafından duyulur.

   (e) Ses dalgalar halinde yayılır.

2. Bir titreşimin ses olarak duyulabilmesi için aşağıdaki koşullardan hangisi olmalıdır?

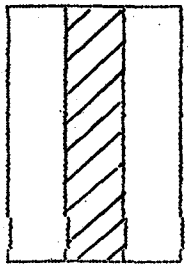
   a) Ultra-Ses olması gerekir.

   b) Enfra-Ses olması gerekir.

   c) Dalgalar halinde yayılması gerekir.

   (d) Frekanslarının 20 ile 20000 sn^{-1} arasında olması gerekir.

   e) Frekanslarının 20 sn^{-1} den küçük, 20000 sn^{-1} den büyük olması gerekir.

3. 

   Şekilde duvarlar arasındaki taralı bölgeye önce su doldurulyor ve sonra su boşaltılıp taralı bölgeye hava dolması sağlanıyor. Daha sonra içerdeki hava çekilip vakum oluşturuluyor. Duvara bir taraftan vuruluyor duvarın öbür tarafı için aşağıdakilerden hangisi doğrudur?

   a) Hava olan ortam sesin en iyi iletildiği ortamdır.

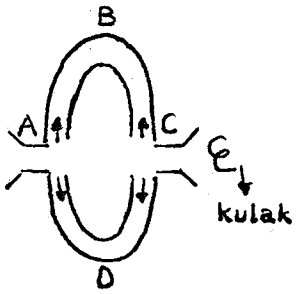
   b) Hava olan ortam sesin iyi iletilemediği ortamdır.

   (c) Vakumlu ortamda ses iletilemediği için öbür tarafa ses geçmez.

   d) Vakumlu ortam sesin en iyi iletildiği ortamdır.

   e) Sıvı ortam sesin iyi iletilemediği ortamdır.

4. Diyapozon



Şekilde iç içe geçmiş iki borudan ABC yolu ADC yoluna eşittir. Alttaki boru 1 m çekildiğine göre diyapozonun frekansı aşağıdakilerden hangisidir?

a) 155

b) 160

(c) 170

d) 187

e) 203

5. Sesin gazlar içinde yayılma hızı aşağıdakilerden hangisine/hangilerine bağlıdır?

a) Sesin frekansına

b) Gazın basıncına

c) Gazın-Basıncına ve sıcaklığına

d) Gazın sıcaklığına ve sesin frekansına

(e) Gazın yoğunluğuna ve sıcaklığına

6. Havada sesin yayılma hızı 330 m/sn verildiğine göre sesin havaya göre yoğunluğu 1,21 olan bir gazdaki yayılma hızı kaç m/sn dir?

a) 264

(b) 300

c) 330

d) 363

e) 440

7. Yayılma hızları eşit yoğunlukları sırası ile (küçükten-büyüğe) $d_2<d_3<d_1$ olan üç katı maddenin esneklik modülleri arasındaki ilişki aşağıdakilerden hangisidir?

a) $E_1<E_2<E_3$

b) $E_3<E_2<E_1$

(c) $E_2<E_3<E_1$

d) $E_1<E_3<E_2$

e) $E_3<E_1<E_2$

8. Sesin sudaki yayılma hızı 1450 $m/_{sn}$ olduğuna göre, suyun hacimsel esneklik modülü kaçtır? (Suyun yoğunluğu 1 $gr/_{cm^2}$ olarak alınacaktır)

a) $2,1\times10^{9}$

(b) $2,1\times10^{10}$

c) $4,2\times10^{9}$

d) $4,2\times10^{10}$

e) $4,2\times10^{11}$

9. Aşağıda titreşen tel formülleriyle ilgili matematiksel ifadelerden hangisi doğrudur?

a) $$f=\frac{1}{2l}\frac{\sqrt{F}}{\sqrt{g}}$$

b) $$f=\frac{1}{4l^2}\cdot\frac{F}{\mu}$$

(c) $$f=\frac{1}{2l}\frac{\sqrt{f}}{\sqrt{\mu}}$$

d) $$f=\frac{\sqrt{F}}{\sqrt{2l.g}}$$

e) $$f=\frac{1}{1}\frac{\sqrt{F}}{\sqrt{\mu/l}}$$

10. Aşağıdaki ses veren tellerin kanunlarıyla ilgili ifadelerden hangisi doğrudur?

a) Titreşen bir telde ana sesin frekansı; telin boyu ile doğru orantılıdır.

b) Titreşen bir telde ana sesin frekansı; teli geren kuvvet ile doğru orantılıdır.

(c) Titreşen bir telde ana sesin frekansı; telin boyca yoğunluğunun karekökü ile ters orantılıdır.

d) Titreşen bir telde ana sesin frekansı; teli geren kuvvetin karekökü ile ters orantılıdır.

e) Titreşen bir telde ana sesin frekansı; telin boyunun karesi ile ters orantılıdır.

11. Bir tel 4 kg.lik bir kuvvetle gerildiğinde frekansı 800 olan ana ses meydana geliyor. Aynı tel 6.25 kg.lık kuvvetle gerildiğinde ana sesin frekansı ne olur?

a) 640 sn^{-1}
b) 1100 sn^{-1}
c) 900 sn^{-1}
d) 850 sn^{-1}
(e) 1000 sn^{-1}

12. Ana sesin frekansı "f" ise harmoniklerinin frekansı aşağıdakilerden hangisidir?

a) Birinci harmoniğinin frekansı 2f, ikincisinin 4f, üçüncüsünün 6f .....

b) Birinci harmoniğinin frekansı f, ikincisinin 3f, üçüncüsünün 5f .....

c) Birinci harmoniğinin frekansı f, ikincisinin f^2, üçüncüsünün f3 .....

d) Birinci harmoniğinin frekansı f, ikincisinin $4f^2$, üçüncüsünün $9f^3$ .....

(e) Birinci harmoniğinin frekansı f, ikincisinin 2f, üçüncüsünün 3f .....

13. Sesin yüksekliği frekansına bağlıdır. Buna göre aşağıdaki ifadelerden hangisi doğrudur?

(a) Frekans arttıkça yükseklik artar.
b) Frekans arttıkça yükseklik azalir.
c) Frekans azaldıkça yükseklik artar.
d) Frekans azaldıkça yükseklik değişmez.
e) Frekans sabit kaldıkça yükseklik zamanla artar.

14. 20 deliği bulunan bir siren iki dakikada 1275 devir yapıyor. Meydana gelen sesin dalga boyu kaç m.dir? (v=340 m/sn)

a) 1,8 m

(b) 1,6 m

c) 2 m

d) 1,4 m

e) 2,2 m

15. Aşağıda verilen ses veren borular ile ilgili ifadelerden hangisi doğrudur?

a) Kapalı ses boruları ana sesin yalnız tek numaralı harmoniklerini, açık ses boruları ise ana sesin yalnız çift numaralı harmoniklerini verir.

b) Kapalı ses boruları ana sesin, yalnız çift numaralı harmoniklerini, açık ses boruları ise yalnız tek numaralı harmoniklerini verir.

(c) Kapalı ses boruları ana sesin yalnız tek numaralı harmoniklerini, açık ses boruları ise ana sesin bütün harmoniklerini verir.

d) Kapalı ses boruları ana sesin bütün harmoniklerini, açık ses boruları ise yalnız tek numaralı harmoniklerini verir.

e) Kapalı ses boruları ve açık ses boruları ana sesin bütün harmoniklerini verir.

16. Kapalı bir ses borusu içinde aralarında 20 cm aralık olan 2 düğüm noktası oluşuyor. Borunun verdiği sesin dalga boyu nedir?

a) 30 cm

b) 20 cm

(c) 40 cm

d) 10 cm

e) 50 cm

17. Açık bir ses borusunun verdiği ana sesin ilk üst tonu (Sesin ikinci harmoniği), uzunluğu 45 cm olan kapalı bir ses borusunun verdiği ana sesin ilk üst tonuna eşittir. Buna göre açık ses borusunun uzunluğu kaç cm.dir?

a) 15

b) 30

c) 45

(d) 60

e) 90

IV. ÖĞRENME BİRİMİ: İNDÜKSİYON

İZLEME TESTİ IV A

1. İndüksiyon akımının elde edilişi ile ilgili kanunu aşağıdaki ifadelerden hangisi tanımlar?

   a) Kapalı bir devreden geçen magnetik akının herhangi bir şekilde değişmesi bu devrede indüksiyon akımının doğmasına ve indüksiyon elektromotor kuvvetinin geçmesine yol açar.

   (b) Kapalı bir devreden geçen magnetik akının herhangi bir şekilde değişmesi bu devrede indüksiyon elektromotor kuvvetinin doğmasına ve indüksiyon akımının geçmesine yol açar.

   c) Kapalı bir devreden geçen magnetik akının herhangi bir şekilde değişmesi bu devrede magnetik akının doğmasına ve indüksiyon elektromotor kuvvetinin geçmesine yol açar.

   d) Kapalı bir devreden geçen magnetik akının herhangi bir şekilde değişmesi bu devrede indüksiyon akımının doğmasına ve magnetik akının geçmesine yol açar.

   e) Kapali bir devreden geçen magnetik akının herhangi bir şekilde değişmesi bu devrede indüksiyon elektromotor kuvvetinin doğmasına ve magnetik akının geçmesine yol açar.

2. Aşağıdaki ifadelerden hangisi Lenz kanununu tanımlar?

   a) Kapalı bir devreden geçen magnetik akı hangi yönde oluyorsa indüksiyon akımı da aynı yönde olur.

   (b) Kapalı bir devreden geçen magnetik akı artıyorsa (veya azalıyorsa) indüksiyon akımı, bunu azaltacak (veya çoğaltacak) bir yönde olur.

   c) İndüksiyon akımının değişim süresi, kendisini meydana getirmekte olan magnetik akı değişim süresi kadardır.

   d) Kapalı bir devreden geçen indüksiyon elektromotor kuvveti hangi yönde oluyorsa indüksiyon akımı da aynı yönde olur.

   e) Kapalı bir devreden geçen indüksiyon elektromotor kuvveti artıyorsa (veya azalıyorsa), indüksiyon akımı bunu azaltacak (veya arttıracak) yönde olur.

3. Bir tel çerçeveden geçen magnetik akı 0,02 saniyede 620000 maxwell'den 20000 maxwell'e düşüyor. Çerçevede meydana gelen indüksiyon e.m.k.'i kaç volttur?

a) 3000

b) 300

c) 30

d) 3

(e) 0,3

4. Kapalı bir devreden geçen magnetik akı $\emptyset=8.10^{3}t^{2}+10^{4}t+10^{5}$ bağıntısına göre degişiyor. Yukarıdaki denklemde (t) saniye, $\emptyset$ (maxwell) ise 3. saniye sonunda devrede oluşan indüksiyon e.m.k.'i kaç volttur?

(a) 0,058

b) 0,048

c) 0,01

d) 0,022

e) 0,026

5. 100 sarımlı bir makara, düzgün bir magnetik alana dik olarak yerleştiriliyor. Magnetik indüksiyon 0,02 saniyede 4000 maxwell/cm^{2}'den sıfıra kadar azaldığında, direnci 50 Ohm olan bu makaradaki akımın şiddeti aşağıdakilerden hangisine eşittir?

a) 2A

b) 0.05 A

c) 0,5 A

(d) 1 A

e) 0,25 A

6. Self indüksiyon katsayısı 500 milihenry olan 750 sarımlı bir makaradan geçen akım, 0,4 saniyede 8 Amper'den 16 Amper'e yükseliyor. Meydana gelen özindüksiyon e.m.k.'i kaç volttur?

   (a) -10 volt

   b) -15 volt

   c) -12 volt

   d) -5 volt

   e) -8 volt

7. Bir devreden geçmekte olan 10 Amperlik bir akım, devrenin açılmasıyla 0,1 saniye içinde sıfır'a düşüyor. Bu sırada 200 volt'luk bir özindüksiyon e.m.k.'i doğduğuna göre, devrenin özindüksiyon katsayısı kaç henry'dir?

   (a) 4

   b) 3

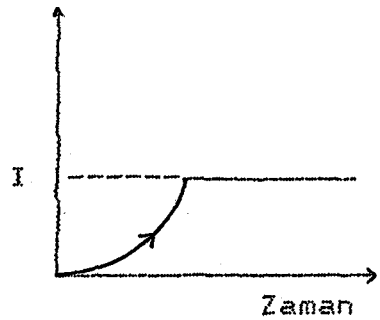
   c) 2

   d) 1

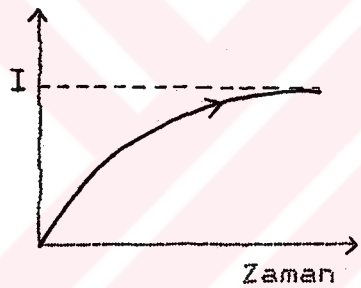
   e) 0,2

8. "Bir üreteç devresindeki anahtar kapatıldığı zaman bu devredeki akımın şiddeti sıfırdan belli bir I değerine kadar yükselir. Bu sırada devredeki akımın artışına karşı koyacak yönde bir özindüksiyon e.m.k.'i doğarak, akımın normal değerine yükselişini geciktirir". Bu durumda anahtar açılıncaya kadar geçen zamana göre yukarıdaki ifadenin grafiği aşağıdakilerden hangisidir?

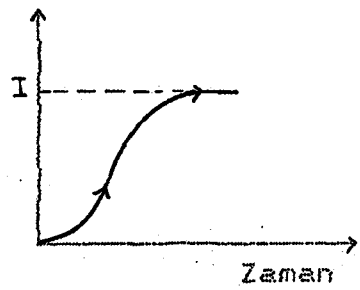
a) Akım



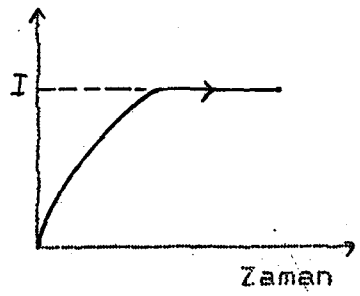
b) Akım



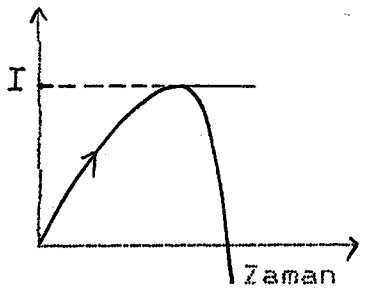
c) Akım



(d) Akım



e) Akım



V. ÖĞRENME BİRİMİ: ALTERNATİF AKIM

İZLEME TESTİ V A

1. Bir devrede maksimum elektromotor kuvveti 25 V olduğuna göre bu devrenin herhangi bir anındaki elektromotor kuvvetinin değerini veren denklem aşağıdakilerden hangisidir?

   a) 5 Sin wt

   b) 5 Cos wt

   c) -5 Sin wt

   d) -5 Cos wt

   (e) 25 Sin wt

2. Bir devrede maksimum akım şiddeti 4 amp. olarak verildiğine göre bu devrenin herhangi bir anındaki akım şiddeti değerini veren denklem aşağıdakilerden hangisidir?

   a) $E=2\sqrt{2}\ \text{Sin}\ \frac{2\pi}{f}\ t$

   b) $E=4\sqrt{2}$ Sin wt

   c) E=2 Sin wt

   d) $E=\sqrt{2}$ Sin wt

   (e) E=4 Sin wt

3. Bir devrede maksimum potansiyel farkı o devrenin t zamanındaki potansiyel farkına eşit olduğuna göre t zaman sonraki peryot (T) değeri aşağıdakilerden hangisidir?

   a) T= t

   b) $T=\frac{t}{2}$

   c) T= 2t

   (d) T= 4t

   e) $T=\frac{t}{4}$

4. Alternatif akımın etkin şiddetini aşğıdaki ifadelerden hangisi tanımlar?

   a) Kendisine değer olarak eşdeğer olan doğru akım şiddetine denir.

   b) Kendisine yön olarak eşdeğer olan doğru akım şiddetine denir.

   c) Kendisine şiddet olarak eşdeğer olan doğru akım şiddetine denir.

   (d) Kendisine ısı bakımından eşdeğer olan doğru akım şiddetine denir.

   e) Kendisine şiddet olarak eşdeğer fakat yön olarak ters olan doğru akım şiddetine denir.

5. Maksimum akım şiddeti 2 amper olduğuna göre etkin akım şiddeti aşağıdakilerden hangisidir?

   (a) $\sqrt{2}$ amp

   b) 2 amp

   c) $\frac{\sqrt{2}}{2}$ amp

   d) 4 amp

   e) 1 amp

6. Sadece sığa bulunan bir devrede akım ile potansiyel arasındaki faz farkı aşağıdakilerden hangisidir?

   a) 0

   b) $\pi/4$

   (c) $\pi/2$

   d) π

   e) 2π

7. Öz indükleme katsayısı 0,2 Henry ve frekansı 50 $\frac{1}{sn}$ olan devrenin indükleme direnci aşağıdakilerdem hangisidir?

(a) $X_L = 62,8$

b) $X_L = 3,14$

c) $X_L = 6,28$

d) $X_L = 31,4$

e) $X_L = 125,6$

8. 40 ohmluk bir dirençle özindükleme katsayısı 0,2 Henry olan bir bobin seri olarak bağlanıyor. Gerilimin frekansı 50 $\frac{1}{sn}$ olduğuna göre devrenin empedansı aşağıdakilerden hangisidir?

a) $z = \sqrt{1600 + (6,28)^2}$

(b) $z = \sqrt{1600 + (62,8)^2}$

c) $z = \sqrt{1600 + (3,14)^2}$

d) $z = \sqrt{1600 + (31,4)^2}$

e) $z = \sqrt{1600 + (125,6)^2}$

9. Sığası 20 mikrofarat olan kondansatör indükleme direnci aşağıdakilerden hangisidir?

$$\left(f = 50\frac{1}{sn}\right)$$

a) $X_c = \dfrac{1}{\pi . 50 . 20}$

b) $X_c = \dfrac{1}{2\pi . 50 . 20}$

(c) $X_c = \dfrac{10^6}{2\pi . 50 . 20}$

d) $X_c = \dfrac{10^6}{\pi . 50 . 20}$

e) $X_c = \dfrac{10^3}{2\pi . 50 . 20}$

10. Sığaları, C_1 ve C_2 olan iki seri bağlı kondansatörden ve bir dirençten oluşan devrenin empedansı aşağıdakilerden hangisidir?

a) $z = \sqrt{R + 2\pi\ f(C_1 + C_2)}$

b) $z = \sqrt{R^2 + 2\pi\ fC_1 + C_2}$

(c) $z = \sqrt{R^2 + \left(\dfrac{C_1 + C_2}{2\pi f . C_1 . C_2}\right)^2}$

d) $z = \sqrt{R^2 + \left(\dfrac{C_1 . C_2}{2\pi f [C_1 + C_2]}\right)^2}$

e) $z = \sqrt{R + \left(\dfrac{C_1 + C_2}{2\pi}\right)}$

11. Sığaları C_1 ve C_2 olan iki paralel kondansatörden ve bir dirençten oluşan devrenin empedansı aşağıdakilerden hangisidir?

a) $z = \sqrt{R+(C_1+C_2)^2}$

b) $z = \sqrt{R^2+(C_1+C_2)^2}$

c) $z = \sqrt{R^2+\left(\dfrac{1}{2\pi f C_1 . C_2}\right)^2}$

d) $z = \sqrt{R^2+\left(\dfrac{C_1 . C_2}{2\pi f}\right)^2}$

(e) $z = \sqrt{R^2+\left(\dfrac{1}{2\pi f (C_1+C_2)}\right)^2}$

12. Öz indükleme katsayısı 0,4 Henry olan bobin, sığası 20 mikrofarat olan kondansatör ve 25 ohmluk direnç seri bağlandığında empedansı aşağıdakilerden hangisi olur?

$\left(f = 50\dfrac{1}{sn}\right)$

(a) $z=\sqrt{625+\left(\dfrac{10^6}{6,28.50.20} - 6,28.50.0,4\right)^2}$

b) $z=\sqrt{25+\left(\dfrac{1}{6,28.50.20} - 6,28.50.0,4\right)^2}$

c) $z=\sqrt{625+\left(\dfrac{10^6}{3,14.50.20} - 3,14.50.0,4\right)^2}$

d) $z=\sqrt{25+\left(\dfrac{1}{3,14.50.20} - 6,28.50.0,4\right)^2}$

e) $z=\sqrt{625+\left(\dfrac{10^6}{3,28.50.20} - 3,14.50.0,4\right)^2}$

13. Bir devreye uygulanan alternatif gerilim ve akım denklemleri V=5Sin5t ve I=2Sin5t şeklindedir. Devrenin güç çarpanı aşağıdakilerden hangisidir?

a) 0

b) $\frac{1}{2}$

c) $\frac{\sqrt{3}}{2}$

d) $\frac{\sqrt{2}}{2}$

(e) 1

14. Bir elektrik aracına V=220Sinwt gerilim uygulanınca $I=4\sin(wt-\frac{\pi}{6})$ akımı geçmektedir. Aracın gücü kaç vattır?

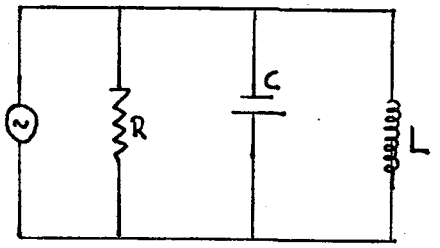
a) 440

b) 880

c) $440\sqrt{3}$

d) $880\sqrt{3}$

(e) $220\sqrt{3}$

15. 

Yandaki elemanlardan geçen akımlar aşağıdakilerden hangisidir?
(Devrenin e.m.k. E'dir.)

R=Direnç C=Kondansatör
L=İndüktans

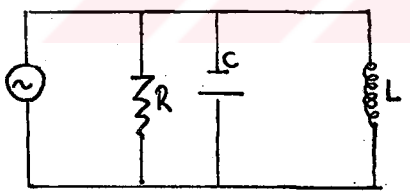
a) $I_R = \frac{E}{X_L}$ $I_L = \frac{E}{R}$ $I_C = \frac{E}{X_C}$

(b) $I_R = \frac{E}{R}$ $I_L = \frac{E}{X_L}$ $I_C = \frac{E}{X_C}$

c) $I_R = \frac{E}{C}$ $IL = \frac{E}{R}$ $IC = \frac{E}{L}$

d) $I_R = R.E$ $I_L = E.X_L$ $I_C = \frac{X_C}{E}$

e) $I_R = \frac{R}{E}$ $I_L = \frac{X_L}{E}$ $I_C = \frac{X_C}{E}$

16. 

Yandaki devrede anakol akımı aşağıdaki ifadelerden hangisidir?
(R=Direnç, C=Kondansatör, L=İndüktans)

a) $I^2(\text{anakol}) = I_R^2 + I_C^2 + I_C^2$

b) $I^2(\text{anakol}) = I_R^2 + (I_C^2 + I_L^2)^2$

c) $I^2(\text{anakol}) = I_R^2 + I_C^2 - I_L^2$

(d) $I^2(\text{anakol}) = I_R^2 + (I_C - I_L)^2$

e) $I^2(\text{anakol}) = I_C^2 + (I_R + I_L)^2$

17. Bir alternatif akım devresi rezonans halindedir. Devredeki bobinin özindükleme katsayısı L= 0,02 Henry ve kondansatör sığası C= 8 μF olduğuna göre rezonans frekansı aşağıdakilerden hangisidir?

(a) $10^5/8\pi$

b) $10^4/2\pi$

c) $\frac{25}{\pi}$

d) $\frac{100}{8\pi}$

e) $\frac{2500}{\pi}$

I. ÖĞRENME BİRİMİ: NEWTON'UN GENEL ÇEKİM KANUNU

İZLEME TESTİ I B

1. Newton'un genel çekim kanununda iki cisim arasındaki çekim kuvveti için aşağıdakilerden hangisi doğrudur?

   a) İki cismin arasındaki uzaklık ile doğru, iki cismin kütleleri ile ters orantılıdır.

   b) İki cismin kütleleri ve iki cismin arasındaki uzaklık ile doğru orantılıdır.

   (c) İki cismin kütleleri ile doğru, iki cismin arasındaki uzaklığın karesi ile ters orantılıdır.

   d) İki cismin arasındaki uzaklığın karesi ve iki cismin kütleleri ile ters orantılıdır.

   e) İki cismin kütleleri ve iki cismin arasındaki uzaklık ile ters orantilidır.

2. Aşağıdaki formüllerden hangisi Newton'un Genel Çekim Kanununun matematiksel ifadesidir?

   (a) $F = k.\dfrac{mM}{d^2}$

   b) $F = m.g$

   c) $F = m.a$

   d) $F = m.\dfrac{V^2}{r}$

   e) $F = m.\dfrac{v}{t}$

3. Aşağıdakilerden hangisi Newton'un genel çekim formülündeki "k" sabitinin birimi olabilir? (kütle: kg, uzaklık: m)

a) $\frac{N.m}{kg^2}$

b) $\frac{N.m}{kg}$

c) $\frac{Nm^2}{kg}$

d) m^3/kg

(e) $\frac{N.m^2}{kg^2}$

4. G evrensel çekim sabiti, r yerin yarıçapı, M yerin kütlesi ve g yerçekim ivmesi olduğuna göre g/M oranı aşağıdakilerden hangisidir?

a) Gr^2

b) $G.r$

c) $\frac{G}{r}$

(d) $\frac{G}{r^2}$

e) $\frac{r^2}{G}$

5. Dünyamızın güneşe uyguladığı çekim kuvveti Fd, güneşin dünyamıza uyguladığı çekim kuvveti Fg dir. Bu kuvvetler arasındaki ilişki için aşağıdakilerden hangisi doğrudur?

(a) $\vec{Fd} = -\vec{Fg}$

b) $\vec{2F_2} = -\vec{Fd}$

c) $\vec{Fd} = \vec{Fg}$

d) $\vec{4Fd} = \vec{Fg}$

e) $\vec{10Fd} = \vec{Fg}$

6. Kütleleri $m_1 = 2m$ ve $m_2 = 3m$ olan iki cismin aralarındaki uzaklık $d=\sqrt{6m^2}$ dir. Bu iki cismin arasındaki çekim kuvveti ne kadardır?
(Evrensel çekim sabiti k olarak alınacaktır.)

a) $4\ km^2$

(b) km^2

c) $6\ km$

d) $k\sqrt{6m}$

e) $k^2.m^2$

7. Yeryüzünün çapı "d" olarak alınırsa aşağıdakilerden hangisi yer kütlesine eşittir?

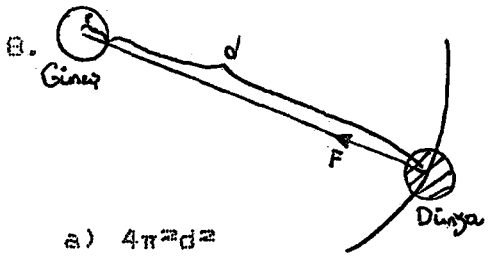
a) $\frac{gd}{4k}$

(b) $\frac{gd^2}{4k}$

c) $g.d^2$

d) $\frac{gk}{4d^2}$

e) $\frac{gd^3}{k}$

8. 

Dünyanın güneş etrafındaki devir süresi T olduğuna göre güneşin kütlesi aşağıdakilerden hangisine eşittir? ($F = m.w^2.r$)

a) $\frac{4\pi^2 d^2}{T^2 k}$

b) $\frac{4\pi^2 r^2}{T^2 k}$

c) $\frac{4\pi^2 (d+r)^2}{T^2 k}$

(d) $\frac{4\pi^2 (d+r)^3}{T^2 k}$

e) $\frac{4\pi^2 (d+r)^3}{T.k}$

9. Yerçekimi ivmesi g ve yarıçapın R olduğunda yerden R kadar bir yükseklikte yerçekimi ivmesi ne olur?

(a) $\frac{g}{4}$

b) 4gR2

c) $2gr^2$

d) $\frac{2g}{r^2}$

e) 2g

10. Dünya üzerindeki ağırlığı 144 kg olan, bir cismin dünyadan 2000 mil yükseklikteki ağırlığı kaç kg'dir? (R= 4000 mil)

a) 78 kg
b) 128 kg
c) 32 kg
d) 55 kg
(e) 64 kg

11. Dünyada 100 kg gelen bir cisim yarıçapı yer yarıçapının 1/3'ü, kütlesi yer kütlesinin 1/10'u kadar olan bir gezegende kaç kg gelir?

a) 75

(b) 90

c) 60

d) 45

e) 30

12. Bir gezegenin kütlesi dünyanın kütlesinin beşte biri ve yarıçapı da dünyanın yarıçapının 2 katıdır. Bu gezegende yer çekimi ivmesi dünyanınkinin kaç katıdır?

(a) 0,05

b) 2

c) 0,5

d) 4

e) 0,04

13. Ekvatordan kutuplara doğru ilerledikçe cisimlerin ağırlığı hakkında ne söylenebilir?

a) Kutuplarda cismin ağırlığı yoktur.

(b) Artar.

c) Değişmez.

d) Azalır.

e) Ağırlık enlemlerden bağımsızdır.

14. Ekvatorun yerin merkezine olan uzaklığı R, yerçekimi ivmesi g ve Türkiye'nin yerin merkezine olan uzaklığı R'nin p katı kadar ise Türkiye'de yerçekimi ivmesi ne olur?

a) $p.g$
b) p^2g
c) $(1/p).g$
(d) $(1/p^2).g$
e) $p.g^2$

15. "Gezegenlerin yörüngeleri, odaklarından birinde güneş bulunan birer elipstir. Herhangi bir gezegeni güneşe birleştiren vektör, eşit zamanlarda eşit alanlar tarar. Gezegenlerin peryotlarının kareleri, güneşe olan ortalama uzaklıklarının küpleri ile orantılıdır." ifadeleri hangi kanunu tanımlar?

a) Newton'un genel çekim kanunu

b) Dinamiğin genel prensibi

c) Momentumun korunumu prensibi

d) Eylemsizlik prensibi

(e) Kepler kanunları

16. Yerkürenin güneşe uzaklığı iki kat artsaydı, güneş etrafındaki bir devri kaç yıl olurdu?

a) 2

b) 2,5

c) 3

d) 2

(e) $2\sqrt{2}$

17. Aşağıdakilerden hangisi basit sarkaç peryodunun matematiksel ifadesidir?

a) $4\pi\sqrt{\frac{1}{g}}$

b) $4\pi^2\frac{1}{g}$

c) $\sqrt{2\pi}.\sqrt{\frac{1}{g}}$

d) $\pi\sqrt{\frac{1}{g}}$

(e) $\sqrt{\frac{4\pi^2 1}{g}}$

18. Uzunluğu 99,4 cm olan bir sarkaç, 10 sn'de kaç tam salınım yapar? ($g = 980\ cm/_{sn^2}$)

a) 30

b) 40

(c) 20

d) 10

e) 50

19. Yer çekimi ivmesinin $g = 980\ cm/_{sn^2}$ olduğu bir yerde peryodu 1,5 sn olan bir sarkaçın, çekim ivmesinin $160\ cm/_{sn^2}$ olduğu bir gezegendeki peryodu kaç saniyedir?

a) 3,45

b) 2,625

c) 1

d) 0,75

(e) $2{,}625\sqrt{2}$

II. ÖĞRENME BİRİMİ: DALGA HAREKETİ

İZLEME TESTİ II B

1. Rüzgarda kuruyan, ipe asılmış bir havlunun hareketi nasıl bir atma örneğidir?

   (a) Enine atma

   b) Boyuna atma

   c) Hem enine hem boyuna atma

   d) Küresel atma

   e) Yüzeysel atma

2. Durgun bir su yüzünde küçük bir asma çöpü hareketsiz haldedir. Uzaktaki bir kaynak peryodik doğrusal atmalar yaymaya başlıyor. Atmalar saman çöpüne ulaştığında çöpün hareketi nasıl olur?

   a) Çöp, kendisine ilk ulaşan atma ile uzaklaşır.

   b) Çöp, atma yüzü boyunca hareket eder.

   c) Çöp, bulunduğu yerde, iki yana çalkalanır.

   (d) Çöp, bulunduğu noktada, aşağı yukarı iner kalkar.

   e) Çöp, hiç hareket etmez.

3. "Ardışık iki dalga tepesi veya dalga çukuru arasındaki uzaklık" ifadesi aşağıdakilerden hangisini tanımlar?

   a) Peryot

   b) Frekans

   c) Faz farkı

   (d) Dalga boyu

   e) Dalganın yayılma hızı

4. Dalga hareketinde frekans, dalga boyu, hız ve peryot arasındaki ilişki için aşağıdaki ifadelerden hangisi doğru olabilir?

   a) λ ile v^2 doğru orantılıdır.
   b) λ ile v doğru orantılıdır.
   c) T ile v doğru orantılıdır.
   d) f ile T doğru orantılıdır.
   (e) λ ile v doğru orantılıdır.

5. Dalga hareketinde frekans, dalga boyu, hız ve peryot değişkenlerini içeren matematikseel ifadelerden hangisi doğrudur?

(a) $f = \frac{v}{\lambda}$

b) $f = T^2$

c) $\lambda = v^2 . T^2$

d) $\lambda = v . f$

e) $\lambda = \sqrt{v . T}$

6. Bir frekans birimi olan kilosikl aşağıdakilerden hangisine eşittir?

a) $1/_{sn}$

b) $10/_{sn}$

(c) $1000/_{sn}$

d) $0.1/_{sn}$

e) $1/_{1000sn}$

7. Frekansı 400 $(1/_{sn})$ olan sesin su içindeki dalga boyu kaç metre'dir? (Sesin sudaki hızı= 350 $m/_{sn}$)

a) 3375

b) 337.5

c) 33.75

(d) 3.375

e) 0.3375

8. Bir dalga merkezinden çikan dalgalar yayıldıkları ortam içinde vardıkları her noktaya genliği ve peryodu dalga merkezi kadar olan fakat ona nazaran bir faz farkı gösteren yeni bir dalga merkezi haline getirirler. Bu olaya ne ad verilir?

(a) Huyghens prensibi
b) Karın noktaları
c) Batman
d) Faz farkı
e) Dalgaların yayılması

9. $\frac{2\pi}{T} = W$ ve $\frac{2\pi}{\lambda} = k$ olduğuna göre aşağıdaki denklemlerden hangisi Sinüzoidal bir dalganın denkleminin ifadesidir?

a) $S_a = S_o \text{Sin} 2\pi(wt-kx)$

(b) $S_a = S_o \text{Sin}(wt-kx)$

c) $S_a = S_o \text{Sin}\left(wt - \frac{kx}{2\pi}\right)$

d) $S_a = S_o \text{Sin} \frac{1}{2\pi} (wt - kx)$

e) $S_a = S_o \text{Sin} \frac{1}{2\pi} (wt - kx)$

10. Genliği 40 cm ve peryodu 1 sn, yayılma hızı 2 cm/sn olarak verildiğine göre dalga merkezinden çıkan dalgaların kaynaktan x kadar uzakta bulunan P noktasındaki hareket denklemi aşağıdakilerden hangisidir?

a) $S_p = 40 \text{ Sin } \pi (t-x)$

b) $S_p = 20 \text{ Sin } \pi (t-x)$

(c) $S_p = 40 \text{ Sin} 2\pi (t-x/2)$

d) $S_p = 40 \text{ Sin} 2\pi (t-x)$

e) $S_p = 20 \text{ Sin} 2\pi (t-x)$

11. Bir titreşim kaynağı S = 20 Sin 5πt (CGS) denklemine göre titreşmektedir. Kaynaktan yayılan dalgaların boyu 40 cm'dir. Kaynaktan x = 20 cm uzakta bulunan bir A noktasında sırasıyla peryot, yayılma hızı ve faz farkı, aşağıdakilerden hangisine eşittir?

a) (0,4, 200, 2π)

(b) (0,4, 100, π)

c) (0,2, 100, 2π)

d) (0,4, 200, π)

e) (0,2, 200, 2π)

12. $\frac{Sin\alpha}{Sin\beta} = \frac{V_1}{V2} = n_{1,2}$ formülü ile ilgili olarak aşağıdaki ifadelerden hangisi doğrudur?

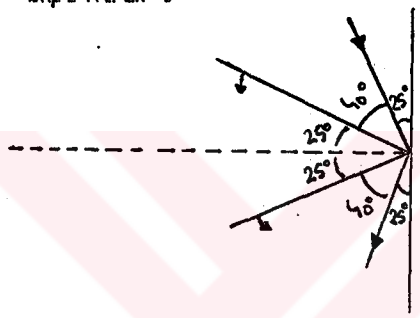
a) Duraklı dalgaların yayılmasini açıklar.

b) Dalgaların yansımasını Hughens prensibi ile açıklar.

(c) Dalgaların kırılmasını Huyghens prensibi ile açıklar.

d) Dalgaların girişimini Huyghens prensibi ile açıklar.

e) Dalgaların süper pozisyonunu Huyghens prensibi ile açiklar.

13. 

Düz bir engele gelen bir atma bu engelde yansıyor. Yandaki şekilde atmaların dalga yüzleri düz çizgi ile ve yayılma doğrultulari oklarla gösterilmiştir. Bu yansıma olayında gelme açisının değeri ne kadardir?

a) 25°

b) 50°

c) 40°

(d) 65°

e) 15°

14. Doğrusal bir su dalgası, düz bir sınırda birdenbire derinleşen ortamın derin kısmından sığ kismına geçiyor. Dalganın derin kısmındaki yayilma hızı 20 cm/sn, sığ kısmındaki hızı da 15 cm/sn olarak ölçülüyor. Sığ kısmın, derin kısma göre kırılma indisi ne kadardır?

a) 1/4

b) 4/7

c) 3/4

d) 7/4

(e) 4/3

15. Bir dalga leğeninde noktasal iki kaynakla bir girişim olayı elde edilmiştir. Kaynaklar aynı fazda çalışırken, dalga leğeninde suya sağ tarafta bir cam levha konlarak bir derinlik farkı oluşturuluyor. Öyle ki cam levhanın kenarı merkez doğrusu ile çıkışıktır. Bu durum girişim deseninde nasıl bir değişiklik yaratır?

(a) Girişim saçakları bütünüyle sağa kayar.

b) Girişim saçakları bütünüyle sola kayar.

c) Sığ taraftaki girişim saçakları sağa kayar.

d) Derin taraftaki girişim saçakları sağa kayar.

e) Sığ taraftaki saçaklar sağa, derin taraftakiler sola kayar.

16. Kaynaklara olan uzaklığı x_1=60 cm ve x_2=84 cm olan bir P noktası maksimum genlikte titreşmektedir. Buna göre dalga boyu aşağıdakilerden hangisidir?

a) 48

b) 84

c) 60

d) 140

(e) 24

17. "Giden ve yansıyan dalgaların girişimi sonucunda meydana gelen dalga sistemi" ifadesi aşağidakilerden hangisinin tanımıdır?

a) Dalgaların süperpozisyonu

b) Dalgaların sönümlenmesi

c) Boyuna dalga

(d) Duraklı dalga

e) Enine dalga

18. Yayılma hızı 4,5 $m/_{sn}$ olan dalgalar sert bir engelde yansıyarak kararlı dalgalar oluşturuyorlar. Kaynağın frekansı 150 $1/_{sn}$ ise 9 cm uzunlukta kaç düğüm ve kaç karın noktası vardır?

a) 5 düğüm, 4 karın noktası

(b) 4 düğüm, 3 karın noktası

c) 4 düğüm, 5 karın noktası

d) 5 düğüm, 5 karın noktası

e) 4 düğüm, 4 karın noktası

19. "Aynı anda ses veren iki kaynağın frekansları birbirinden biraz farklı olursa duyulan sesin frekansında azalma veya çoğalma olur" ifadesi aşağıdakilerden hangi olayın tanımıdır?

a) Rezonans

b) Girişim

(c) Vuru

d) Huyghens prensibi

e) Faz farkı

20. Yan yana duran ve aynı zamanda ses veren iki kaynaktan birincisinin frekansı 440'dır. Bir kişi 14,7 sn'de 50 vuru sayıyor. Ikinci kaynağın frekansı nedir?

a) 433,6

(b) 436,6

c) 443,6

d) 446,6

e) 453,6

21. Bir köprüden uygun adım askerler geçmektedir. Köprünün bir süre sonra yıkılmasini aşağıdaki olaylardan hangisi açıklar?

a) Vuru
b) Batman
c) Girişim
(d) Rezonans
e) Huyghens prensibi

III. ÖĞRENME BİRİMİ: SES

İZLEME TESTİ III B

1. Sesin titreşim özellikleri ile ilgili aşağıdaki ifadelerden hangisi doğrudur?

   a) Ses her ortamda yayılabilme özelliğine sahiptir.

   b) Sesin hızı ortama bağlı değildir.

   (c) Ses dalgaları boyuna dalgalardır.

   d) Ses, frekansı değişse de, kulağımızla duyulabilir.

   e) Titreşen her cisim ses verir.

2. Bir titreşimin ses olarak duyulabilmesi için frekansının aşağıdaki sınırlardan hangisinde olması gerekir?

   a) $f \leq 20\ sn^{-1}$

   b) $f \geq 20000\ sn^{-1}$

   c) $f \leq 20\ sn^{-1}$ veya $f \geq 20000$ sn-1

   d) $20\ sn^{-1} < f < 2000\ sn^{-1}$

   (e) $20\ sn^{-1} < f < 20000\ sn^{-1}$

3. Bir ses cihazından farklı ortamlarda ses dalgaları yayılıyor. Buna göre aşağıdaki ifadelerden hangisi doğrudur?

   (a) Katı ortam sesin en iyi yayıldığı ortamdır.

   b) Katı ortam sesin en kötü yayıldığı ortamdır.

   c) Vakumlu ortam sesin en iyi yayıldığı ortamdır.

   d) Gaz ortamı sesin en iyi yayıldığı ortamdır.

   e) Gaz ortamında ses iletilemez.

4. Bir S kaynağından çıkan ses dalgaları içlerinde hava bulunan SABO ve SDCO kollarından geçip vardıkları O noktasında minimum etki yapıyorlar. Bu durumun ardından gelen minimum sesi duymak için CD kolu 48 cm uzatılırsa kaynaktan çıkan ses dalgalarının boyu ve frekansı ne olur?[(cm), f(sn-1)]

   a) (48,548)

   (b) (48,696)

   c) (96,548)

   d) (96,696)

   e) (24,696)

5. Kapalı bir kap içinde bulunan bir gazın sıcaklığı sabit kalacak şekilde basıncı arttırılıyor ve daha sonra basıncı sabit kalacak şekilde sıcaklığı arttırılıyor. Buna göre aşağıdaki ifadelerden hangisi doğrudur?

   a) Gazın basıncı arttıkça sesin yayılma hızı artar, sıcaklığı arttıkça yayılma hızı düşer.

   b) Gazın basıncı arttıkça sesin yayılma hızı artar, sıcaklığı degiştikce yayılma hızında değişiklik olmaz.

   c) Gazın basıncı arttıkca sesin yayılma hızı düşer, sıcaklığı arttikça yayılma hızı artar.

   (d) Gazın basıncının degişmesiyle sesin yayılma hızı değişmez, sıcakliğı arttıkça yayılma hızı artar.

   e) Gazın basıncı ve sıcaklığı arttıkça sesın yayılma hızı artar.

6. Bir gaz içinde 0°C de sesin hızı 300 m/$_{sn}$ ise sesin 22,75 °C de yayılma hızı aşağıdakilerden hangisidir?

   (a) 325

   b) 300

   c) 275

   d) 330

   e) 270

7. Esneklik katsayıları aynı yoğunlukları $d_1 > d_2 > d_3$ olarak değişen üç katı maddenin yayılma hızları arasındaki ilişki için aşağıdakilerden hangisi doğrudur?

a) $V_1 > V_2 > V_3$

(b) $V_3 > V_2 > V_1$

c) $V_2 > V_3 > V_2$

d) $V_2 > V1 > V3$

e) $V_1 = V_2 = V_3$

8. Yayılma hızları sırasıyla $V_1=250$ $V_2=300$ $V_3=400$ ve yoğunlukları sırasıyla $d_1=9,0$ $d_2=6,25$ $d_3=4,0$ olarak verilen üç katı maddenin esneklik modülleri arasındaki ilişki aşağıdakilerden hangisidir?

a) $E_2 > E_1 > E_3$

b) $E_1 > E_3 > E_2$

c) $E_3 > E_1 > E_2$

(d) $E_3 > E_2 > E1$

e) $E_1 > E_2 > E_3$

9. f= frekans, F= Germe kuvveti, μ=boyca yoğunluk, 1= boy olmak üzere $f = \frac{1}{2l}\sqrt{\frac{F}{\mu}}$ ifadesi aşağıdakilerden hangisini hesaplamada kullanılır?

a) Katılarda yayılan bir sesin fekansını

b) Sıvılarda yayılan bir sesin frekansını

c) Gazlarda yayılan bir sesin frekansını

d) Açık ses borusunun frekansını

(e) Titreşen bir telin frekansını

10. Titreşen tel kanunları ile ilgili ifadelerden hangisi doğrudur?

(a) Titreşen bir telde ana sesin frekansı; telin boyu ile ters, teli geren kuvvetin kare kökü ile doğru ve telin boyca yoğunluğunun kare kökü ile ters orantılıdır.

b) Titreşen bir telde ana sesin frekansı; telin boyu ile ters, teli geren kuvvetin kare kökü ile ters ve telin boyca yoğunluğunun kare kökü ile ters orantılıdır.

c) Titreşen bir telde ana sesin frekansı; telin boyu ile ters, teli geren kuvvetin kare kökü ile ters ve telin boyca yoğunluğunun kare kökü ile doğru orantılıdır.

d) Titreşen bir telde ana sesin frekansı; telin boyu ile doğru, teli geren kuvvetin kare kökü ile doğru ve telin boyca yoğunluğunun kare kökü ile doğru orantılıdır.

e) Titreşen bir telde ana sesin frekansı; telin boyu ile doğru, teli geren kuvvetin kare kökü ile ters ve telin boyca yoğunluğunun kare kökü ile doğru orantılıdır.

11. Bir tel ana sesinin frekansı 1000 $\frac{1}{sn}$ olacak şekilde titreşmektedir. Aynı cins maddeden yapılmış, fakat çapı, uzunluğu ve genliği birincinin 2 katı olan başka bir telin ana sesinin frekansı kaç $\frac{1}{sn}$ dir?

a) $175.\sqrt{3}$

(b) $250.\sqrt{2}$

c) $240.\sqrt{5}$

d) $150.\sqrt{2}$

e) 250

12. Boyu 60 cm ve 1 cm'sinin kütlesi 0,5 gr olan bir tel 7,2 Newtonluk kuvvetle gerilmiştir. Bu telin 4'üncü harmoniğinin frekansı kaç 1/sn dir?

a) 4

(b) 40

c) 400

d) 20

e) 200

13. Aşağıdaki sesin fizyolojik özellikleri ile ilgili ifadelerden hangisi doğrudur?

a) Tını, genliği ve kulağa olan uzaklığı aynı olan sesleri birbirinden ayıran özellik olup, kaynağın cinsine bağlıdır.

b) Tını, genliği ve şiddeti aynı olan sesleri birbirinden ayıran özellik olup, kaynağın cinsine bağlıdır.

(c) Tını, yüksekliği ve şiddeti aynı olan sesleri birbirinden ayıran özellik olup, kaynağın cinsine bağlıdır.

d) Tını, yüksekliği ve frekansı aynı olan sesleri birbirinden ayıran özellik olup, ses kaynağının kulağa olan uzaklığına bağlıdır.

e) Tını, genliği ve şiddeti aynı olan sesleri birbirinden ayıran özellik olup, ses kaynağının genliğine bağlıdır.

14. Kapalı bir ses borusu içinde, aralarında 20 cm aralık olan iki düğüm noktası oluşmaktadır. Üzerinde 20 deliği bulunan bir sirenin aynı yükseklikte bir ses verebilmesi için dakikada kaç dönme yapması gerekir?
(Havadaki ses hızı 340 m/sn)

a) 42,5

b) 1275

c) 95

d) 67,5

(e) 2550

15. Ana sesi f_1, kapalı ses borularında ana sesin harmonikleri $f_k = k.f_1$ ve açık ses borularında ana sesin harmonikleri, $f_n = n.f_1$ olarak verilmektedir. Buna göre "k" ve "n" için aşağıdakilerden hangisi doğrudur?

a) k= 1,2,3,4 ..... n= 2,4,6,8 .....

b) k= 2,4,6,8 ..... n= 1,2,3,4,5 .....

c) k= 1,3,5,7 ..... n= 2,4,6,8 .....

d) k= 1,2,3,4 ..... n= 1,3,5,7 .....

(e) k= 1,3,5,7 ..... n= 1,2,3,4,5 .....

IV. ÖĞRENME BİRİMİ: İNDÜKSİYON

İZLEME TESTİ IV B

1. Aşağıdaki ifadelerden hangisi indüksiyon akımının elde edilişi ile ilgili kanunu tanımlar?

   a) İndüksiyon elektro motor kuvvetinin değişim süresi, kendisini meydana getirmekte olan indüksiyon akımının süresi kadardır.

   b) İndüksiyon elektro motor kuvvetinin değişim süresi, kendisini meydana getirmekte olan magnetik kuvvetin değişim süresi kadardır.

   c) Magnetik kuvvetin değişim süresi, kendisini meydana getirmekte olan indüksiyon akımının süresi kadardır.

   d) Magnetik kuvvetin değişim süresi, kendisini meydana getirmekte olan magnetik akı değişim süresi kadardır.

   (e) İndüksiyon akımının süresi kendisini meydana getirmekte olan magnetik akı değişim süresi kadardır.

2. Kapalı bir devreden geçen magnetik akı azalmaktadır. Lenz Kanununa göre aşağıdaki ifadelerden hangisi doğrudur?

   (a) İndüksiyon akımı bu magnetik akıyı arttıracak yönde olur.

   b) İndüksiyon akımı bu magnetik akıyı arttıracak, indüksiyon elektromotor kuvveti azltacak yönde olur.

   c) İndüksiyon akımı bu magnetik akıyı azaltacak yönde olur.

   d) İndüksiyon akımi bu magnetik akıyı azaltacak, elektromagnetik kuvveti arttıracak yönde olur.

   e) İndüksiyon elektromotor kuvveti bu magnetik akıyı arttıracak yönde olur.

3. 40 sarımlı bir çerçevenin her sarımının yüzölçümü 800 cm^2'dir, ve çerçeve alan şiddeti 1000 gauss olan bir magnetik alan içine dik durumdan 90^o dönerek kuvvet çizgilerine paralel duruma geldiği zaman, meydana gelen indüksiyon e.m.k.'i kaç volttur?

   a) 6,9

   b) 19,2

   c) 18,6

   (d) 25,6

   e) 12,3

4. Bir sarımlı halkadan geçen magnetik akının zamana bağlı olarak denklemi $\Phi=2.10^8t^2+4.10^8t$ maxwell ise ilk bir saniyede halkada oluşan indüksiyon e.m.k. aşağıdakilerden hangisidir?

   a) 6 V

   (b) 8 V

   c) 12 V

   d) 16 V

   e) 8.10^{-8}

5. Direnci 0,12 ohm olan bir tel 100 sarımlı yassi ve dairesel bir makara şeklinde sarıldıktan sonra uçları birleştiriliyor. Bir miknatisin N kutbu bu makara ekseni boyunca yaklaştırılmak suretiyle her sarımdan geçen magnetik akı 0,3 sn içinde 1200 maxwell'den 8000 maxwell'e çikıyor. Telden geçen akımın değeri aşağıdakilerden hangisidir?

   a) 0,0226 A

   (b) 0,188 A

   c) 1,09 A

   d) 0,08 A

   e) 0,653 A

6. Bir makaranın özindüksiyon katsayısı 0,12 Henry'dir. Bu makaradan geçen akım 2 saniyede 10 amperden 50 ampere çıktığına göre devrede ne değerde bir özindüksiyon e.m.k.'ti oluşur?

   a) -8,4 volt

   b) -1,6 volt

   (c) -2,4 volt

   d) -3 volt

   e) -2 volt

7. Bir makaradan geçen akım şiddeti 0,8 saniyede 15 amper'den 9 amper'e düşüyor. Bu esnada 12 volt'luk bir indüksiyon e.m.k. meydana geliyor. Makaranın özindüksiyon katsayısı kaç milihenry'dir?

   a) 1,6

   (b) 1600

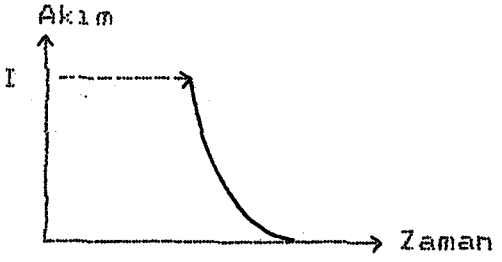
   c) 16

   d) 160

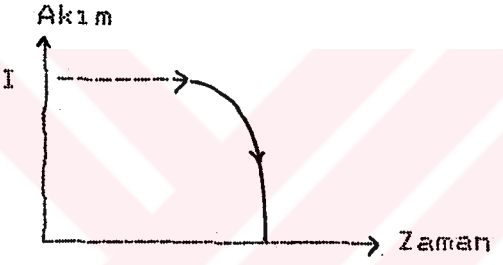
   e) 16000

8. Bir üreteç devresindeki anahtar açıldığı zaman devredeki akımın şiddeti I değerinden 0 değerine kadar azalacaktır. Bu sırada oluşan özindüksiyon e.m.k.'ti azalan bu akımı devam ettirmeğe çalışmak ister. Ancak, devre açılmış olduğu için, buna imkan bulamaz. Bununla birlikte, devredeki akımın kesilişi de bir anda olamamaktadır. Bu ifadenin zamana göre grafiği aşağıdakilerden hangisidir?

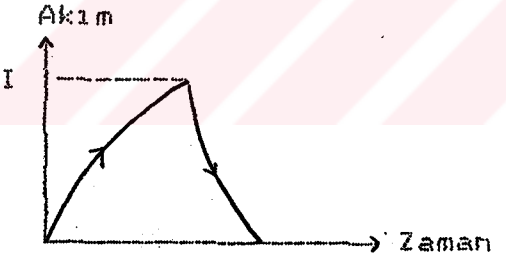
(a)



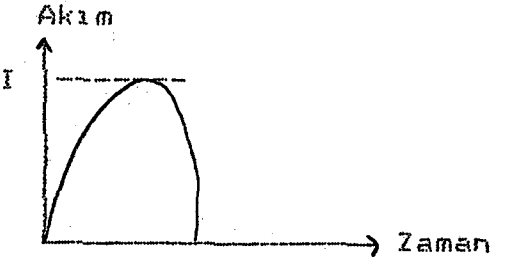
b)



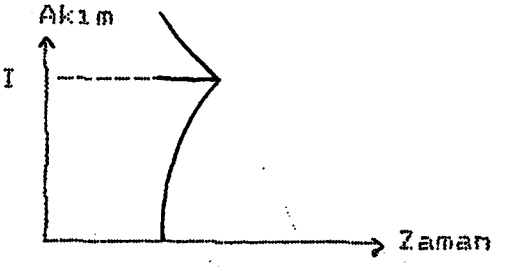
c)



d)



e)



V. ÖĞRENME BİRİMİ: ALTERNATİF AKIM

İZLEME TESTİ V B

1. Bir alternatif akım devresinde maksimum elektromotor kuvveti 16 V olduğuna ve bu devrenin akım peryodu 1 sn olduğuna göre herhangi bir "t" zamanındaki eletromotor kuvvetinin değeri aşağıdakilerden hangisidir? (π=3,0 alınız)

   a) E= 6 Sin 4t

   b) E= 4 Sin 6t

   c) E= 4 Sin 3t

   (d) E= 16 Sin 6t

   e) E= 16 Sin 3t

2. Bir alternatif akım devresinde maksimum akım şiddeti 9 amp olarak verildiğine göre bu devrenin herhangi bir anındaki akım şiddeti değerini veren denklem aşağıdakilerden hangisidir?

   a) E= $3\sqrt{3}$ Sinwt

   b) E= 3 Sinwt

   (c) E= 9 Sinwt

   d) E= $9\sqrt{2}$ Sinwt

   e) E= 18 Sinwt

3. Alternatif akım peryotu "T" ve maksimum potansiyel farkı "t" zaman sonraki potansiyel farkının iki katına eşit olduğuna göre t-zaman sonraki frekans aşağıdakilerden hangisidir?

   (a) f= 12/t

   b) f= 6/t

   c) f= 4/t

   d) f= 8/t

   e) f= 2/t

4. Aşağıdaki ifadelerden hangisi etkin potansiyel farkının tanimidir?

   a) Kendisine yön olarak eşdeğer olan doğru akim devresinin potansiyel farkına eşittir.

   b) Kendisine değer olarak eşdeğer olan doğru akım devresindeki potansiyel farkına eşittir.

   c) Kendisine değer olarak eşdeğer fakat yön olarak ters yönde olan doğru akım devresindeki potansiyel farkına eşittir.

   d) Kendisine yön olarak eşdeğer fakat değer olarak eşdeğer olmayan doğru akım devresindeki potansiyel farkına eşittir.

   (e) Termik voltmetre ile ölçülen potansiyel farkına eşittir.

5. Bir alternatif akım devresinde maksimum akım şiddeti 4 amp. olduğuna göre etkin akım şiddeti aşağıdakilerden hangisidir?

   a) 2 amp.

   (b) $2\sqrt{2}$ amp.

   c) 4 amp.

   d) $4\sqrt{2}$ amp.

   e) 16 amp.

6. Sadece bobin bulunan bir devrede akım ile potansiyel arasındaki faz farkı aşağıdakilerden hangisidir?

   (a) 0

   b) $\pi/4$

   c) $\pi/3$

   d) $\pi/2$

   e) π

7. Öz indükleme katsayısı 0,4 Henry olan bir makaranın indükleme direnci aşağıdakilerden hangisidir?

$$\left(f=49\ \frac{1}{sn}\right)\quad \left(\pi=\frac{22}{7}\right)$$

a) 111,6

(b) 123,2

c) 146,8

d) 132,2

e) 146,4

8. Direnci 30 ohm olan bir telle özindükleme katsayısı 0,4 Henry olan bir bobin seri olarak bağlanıyor. Devrenin empedansı aşağıdakilerden hangisidir?

$$\left(f=49\ \frac{1}{sn},\ \pi=\frac{22}{7}\right)$$

(a) $z^2= 900 + (123,2)^2$

b) $z^2= 900 + (146,8)^2$

c) $z^2= 30 + 123,2$

d) $z^2= 30 + 146,8$

e) $z^2= 900+ (123,2)^2$

9. 7 mikrofaratlık bir sığaya sahip olan kondansatörün indükleme direnci aşağıdakilerden hangisidir?

$$\left(f=\frac{500}{22}\ sn^{-1},\ \pi=\frac{22}{7}\right)$$

a) $X_c= 10^{-3}$

(b) $X_c= 10^{3}$

c) $X_c= 1$

d) $X_c= 10^{6}$

e) $X_c= 10^{-6}$

10. Sığaları 2'şer farad olan 2 seri bağlı kondansatör ve R ohm'luk bir dirençten oluşan devrenin empedansı aşağıdakilerden hangisidir? (π= 3,14)

a) $z^2 = R^2 + (6,28.f)^2$

b) $z = R^2 + \left(\frac{1}{3,14f}\right)^2$

c) $z = R + \frac{1}{6,28\ f}$

(d) $z = \sqrt{R^2 + \left(\frac{1}{6,28f}\right)^2}$

e) $z = \sqrt{R^2 + (6,28.f)^2}$

11. Sığaları 2 ve 1,5 farad olan 2 tane paralel bağlı kondansatörden ve 5 ohmluk bir dirençten oluşan devrenin empedansı aşağıdakilerden hangisidir? (π = 22/7)

(a) $z^2 = 25 + (\pi f)^{-2}$

b) $z^2 = 25 + (\pi f)^2$

c) $z^2 = \sqrt{25 + (\pi f)^2}$

d) $z^2 = \sqrt{25 + (\pi f)^2}$

e) $z^2 = 5 + (\pi f)^2$

12. 200 ohm'luk bir direnç, 0,5 henry'lik bir indüktans ve 20 µf'lik bir kondansatör seri halinde bağlanıyor. Devrenin empedansı kaç ohm'dur?

$\left(f = \frac{100}{\pi} \quad \frac{1}{sn}\right)$

a) 150 ohm

b) 200 ohm

(c) 250 ohm

d) 100 ohm

e) 50 ohm

13. Bir alternatif akım devresinin direnci 3 ohm, empedansı 6 ohm olduğuna göre güç çarpanı aşağıdakilerden hangisidir?

a) $\frac{\sqrt{2}}{2}$

b) 2

(c) 0,5

d) $\pi/3$

e) $\pi/2$

14. Bir ütüye $V=110\ \mathrm{Sin}(wt)$ gerilimi uygulanınca $I=6\ \mathrm{Sin}\left(wt-\frac{\pi}{3}\right)$ akımı geçmektedir. Ütünün gücü kaç vattır?

a) 110

(b) 165

c) 220

d) 330

e) 660

15. Paralel bağlı bir direnç, indüktans ve kondansatörden oluşan devrede bu elemanlardaki akımlar aşağıdakilerden hangisi olabilir?

(a) $I_R=\frac{E}{R}$ $I_L=\frac{E}{2\pi f.L}$ $I_C=E.2\ \pi\ f.C$

b) $I_R=\frac{E}{2\pi f.L}$ $I_L=\frac{E}{R}$ $I_C=E.2\ \pi\ f.C$

c) $I_R=E.2\pi f.C$ $I_L=\frac{E}{R}$ $I_C=\frac{E}{2\pi fL}$

d) $I_R=R.E$ $I_L=2\pi f.L.E$ $I_C=\frac{E}{2\pi f.C}$

e) $I_R = \frac{R}{E}$ $\quad I_L = \frac{2\pi f L}{E}$ $\quad I_C = \frac{1}{2\pi f . C . E}$

16. Paralel bağlı bir direnç, indüktans ve kondansatörden oluşan bir devrede sırasıyla bu elemanlardan geçen akımlar $I_R = 4A$, $I_C = 7A$, $I_L = 4A$ olduğuna göre anakol akımı aşağıdakilerden hangisidir?

a) 3A

b) 4A

(c) 5A

d) 6A

e) 12A

17. Bir alternatif akım devresi rezonans halindedir. Devredeki bobinin özindükleme katsayısı L= 0,03 Henry ve kondansatörun sığası C= 0,27 μF olduğuna göre rezonans frekansı aşağıdakilerden hangisidir?

(a) $10^6/9\pi$

b) $10^4/9\pi$

c) $10^4/18\pi$

d) $10^6/18\pi$

e) $10^5/9\pi$

FİZİK ERİŞİ TESTİ

1. Aşağıdaki ifadelerden hangisi Newton'un genel çekim kanununu tanımlar?

   a) İki cisim arasındaki çekim kuvveti bunların kütleleri ve aralarındaki uzaklığın karesi ile ters orantılıdır.

   b) İki cisim arasındaki çekim kuvveti bunların kütleleri ile doğru, aralarındaki uzaklık ile ters orantılıdır.

   (c) İki cisim arasındaki çekim kuvveti bunların kütleleri ile doğru, aralarındaki uzaklığın karesi ile ters orantılıdır.

   d) İki cisim arasındaki çekim kuvveti bunların kütlelerinin karesi ile doğru, aralarındaki uzaklık ile ters orantılıdır.

   e) İki cisim arasındaki çekim kuvveti bunların kütleleri ve aralarındaki uzaklığın karesi ile doğru orantılıdır.

(I. Öğrenme Birimi, Öğrenme Hedefi IA)

2. Aşağıdakilerden hangisi Newton'un genel çekim formülündeki k sabit birimi olabilir?

   a) $\frac{dyn.cm}{gr\text{-}kût^2}$

   b) $\frac{dyn.cm}{gr\text{-}kût}$

   c) $cm^2/s^2g\text{-}kût$

   d) $cm^3/s^2\text{-}kût$

   (e) $dyn.cm^2/gr.kût^2$

(I. Öğrenme Birimi, Öğrenme Hedefi IIIA)

3. Ağırlıkları 2 ve 1/2 kg olan iki kürenin merkezleri arasındaki uzaklık 10 cm iken birbirlerine yaptıkları çekim kuvveti kaç dyn'dir? (k= $6,7 \times 10^{-8}$ alınacaktır.)

a) $6,7.10^{-2}$

b) $6,7.10^{-3}$

(c) $6,7.10^{-4}$

a) $6,7.10^{-5}$

a) $6,7.10^{-6}$

(I. Öğrenme Birimi, Öğrenme Hedefi VIA)

4. Yeryüzünün yarıçapı R olarak alınırsa, aşağıdakilerden hangisi yer kütlesine eşittir?

a) $\frac{gR}{k}$

b) $\frac{gk}{R}$

c) gR

(d) $\frac{gR^2}{k}$

e) $\frac{gk}{R^2}$

(I. Öğrenme Birimi, Öğrenme Hedefi VIIA)

5. Dünyanın güneşe olan uzaklığı d ve güneş etrafındaki devir süresi T ise, güneş kütlesi aşağıdakilerden hangisine eşittir?

a) $\frac{2\pi^2 d^2}{T^2 k}$

(b) $\frac{4\pi^2 d^3}{T^2 k}$

c) $\frac{4\pi^2 d}{T^2 k}$

d) $\frac{\pi^2 d^2}{Tk}$

e) $\frac{4\pi^2 d^2}{Tk}$

(I. Öğrenme Birimi, Öğrenme Hedefi VIIIA)

6. Yerçekimi ivmesinin 980 cm/$_{sn}$2 olduğu bir yerde kaç metre yüksekğe çıkarılırsa yerçekimi ivmesi 979 cm/$_{sn}$2 olur? (R= 6400 km)

(a) 3200 m.

b) 6400 m.

c) 1600 m.

d) 3600 m.

e) 12800 m.

(I. Öğrenme Birimi, Öğrenme Hedefi IXA)

7. Bir gezegenin kütlesi yer kütleşinin 1/9'u ve yarıçapı da yer yarıçapının yarısıdır. Dünyada 9 kg gelen bir cisim gezegende kaç kg. gelir?

a) 4/9 kg

b) 2 kg

c) 9/4 kg

d) 9 kg

(e) 4 kg

(I. Öğrenme Birimi, Öğrenme Hedefi XIA)

8. Kutuplarda 27 kg gelen bir cismin ekvatordaki ağırlığı ne olur?

a) 27 kg'dan fazla

b) 27 kg

c) 54 kg

(d) 27 kg'dan az

e) 54 kg'dan fazla

(I. Öğrenme Birimi, Öğrenme Hedefi XIIIA)

9. Bir A gezegenin peryodu, B gezegeninin peryodunun 8 katıdır. A'nin ortalama yörünge çapı B'ninkinin kaç katıdır?

(a) 4

b) 1/4

c) 8

d) 1/8

e) 64

(I. Öğrenme Birimi, Öğrenme Hedefi XVIA)

10. Dünya yüzeyindeki peryodu 2 sn olan bir sarkacın çekim ivmesi 2.43 m/sn2 olan bir gezegendeki peryodu kaç sn'dir? (Dünyanin çekim ivmesi 9,8 m/sn2'dir.)

a) 8 sn

b) 16 sn

(c) 4 sn

d) 14 sn

e) 2 sn

(I. Öğrenme Birimi, Öğrenme Hedefi XIXA)

11. G evrensel çekim sabiti, r yerin yarıçapı, M yerin kütlesi ve g yerçekim ivmesi olduğuna göre g/M oranı aşağıdakilerden hangisidir?

a) Gr^2

b) $G.r$

c) $\frac{G}{r}$

(d) $\frac{G}{r^2}$

e) $\frac{r^2}{G}$

(I. Öğrenme Birimi, Öğrenme Hedefi IVB)

12. Dünyamızın güneşe uyguladığı çekim kuvveti Fd, güneşin dünyamıza uyguladığı çekim kuvveti Fg dir. Bu kuvvetler arasındaki ilişki için aşağıdakilerden hangisi doğrudur?

(a) $\overrightarrow{Fd} = -\overrightarrow{Fg}$

b) $\overrightarrow{2F_2} = -\overrightarrow{Fd}$

c) $\overrightarrow{Fd} = \overrightarrow{Fg}$

d) $\overrightarrow{4Fd} = \overrightarrow{Fg}$

e) $\overrightarrow{10Fd} = \overrightarrow{Fg}$

(I. Öğrenme Birimi, Öğrenme Hedefi VB)

13. Kütleleri $m_1 = 2m$ ve $m_2 = 3m$ olan iki cismin aralarındaki uzaklık $d = \sqrt{6}m.$'dir. Bu iki cismin arasındaki çekim kuvveti ne kadardır?
(Evrensel çekim sabiti k olarak alınacaktır.)

a) $4\ km^2$

(b) km^2

c) $6\ km$

d) $k\sqrt{6m}$

e) $k^2.m^2$

(I. Öğrenme Birimi, Öğrenme Hedefi VIB)

14. Yeryüzünün çapı "d" olarak alınırsa aşağıdakilerden hangisi yer kütlesine eşittir?

a) $\frac{gd}{4k}$

(b) $\frac{gd^2}{4k}$

c) $g.d^2$

d) $\frac{gk}{4d^2}$

e) $\frac{gd^3}{k}$

(I. Öğrenme Birimi, Öğrenme Hedefi VIIB)

15. Dünyada 100 kg gelen bir cisim, yarıçapı yer yarıçapının 1/3'u, kütlesi yer kütlesinin 1/10'u kadar olan bir gezegende kaç kg gelir?

a) 75

(b) 90

c) 60

d) 45

e) 30

(I. Öğrenme Birimi, Öğrenme Hedefi XIB)

16. Ekvatordan kutuplara doğru ilerledikçe cisimlerin ağırlığı hakkında ne söylenebilir?

a) Kutuplarda cismin ağırlığı yoktur.

(b) Artar.

c) Değişmez.

d) Azalır.

e) Ağırlık enlemlerden bağımsızdır.

(I. Öğrenme Birimi, Öğrenme Hedefi XIIIB)

17. Ekvatorun yerin merkezine olan uzaklığı R, yerçekimi ivmesi g ve Türkiye'nin yerin merkezine olan uzaklığı R'nin p katı kadar ise Türkiye'de yerçekimi ivmesi ne olur?

a) $p.g$

b) p^2g

c) $\frac{1}{p} \cdot g$

(d) $\frac{1}{p^2} g$

e) $p.g^2$

(I. Öğrenme Birimi, Öğrenme Hedefi XIVB)

18. "Gezegenlerin yörüngeleri, odaklarından birinde güneş bulunan birer elipstir. Herhangi bir gezegeni güneşe birleştiren vektör, eşit zamanlarda eşit, alanlar tarar. Gezegenlerin peryotlarının kareleri, güneşe olan ortalama uzaklıklarının küpleri ile orantılıdır." ifadeleri hangi kanunu tanımlar?

a) Newton'un genel çekim kanununu

b) Dinamiğin genel prensibi

c) Momentunun korunumu prensibi

d) Eylemsizlik prensibi

(e) Kepler kanunları

(I. Öğrenme Birimi, Öğrenme Hedefi XVB)

19. Yerkürenin güneşe uzaklığı iki kat artsaydı güneş etrafındaki bir devri kaç yıl olurdu?

a) 2

b) 2,5

c) 3

d) 2

(e) $2\sqrt{2}$

(I. Öğrenme Birimi, Öğrenme Hedefi XVIB)

20. Yer çekimi ivmesinin g= 980 $cm/_{sn}2$ olduğu bir yerde peryodu 1,5 sn olan bir sarkacın, çekim ivmesinin 160 $cm/_{sn}2$ olduğu bir gezegendeki peryodu kaç saniyedir?

a) 3.45

b) 2,625

c) 1

d) 0,75

(e) $2,625\sqrt{2}$

(I. Öğrenme Birimi, Öğrenme Hedefi XIXB)

21. Bir ucuna bir kütle bağlanarak, bir çiviye asılmış serbest bir sarmal yay, kendi doğrultusunda sıkıştırılıp bırakılırsa titreşme başlar. Bu sarmal yaydaki hareket nasıl bir dalga (atma) örneğidir?

a) Enine atma

(b) Boyuna atma

c) Hem enine, hem boyuna atma

d) Küresel atma

e) Yüzeysel atma

(II. Öğrenme Birimi, Öğrenme Hedefi IIA)

22. Aşağıdaki ifadelerden hangisi doğrudur? (λ: Dalga Boyu, T: Peryot, f: Frekans, v: Hız)

a) λ ile v ters orantılıdır.

b) λ ile T ters orantılıdır.

c) T ile f doğru orantılıdır.

(d) T ile f ters orantılıdır.

e) λ ile f doğru orantılıdır.

(II. Öğrenme Birimi, Öğrenme Hedefi IVA)

23. Saniyede 400000 salınım yapan bir radyo dalgasının dalga boyu km olarak aşağıdakilerden hangisidir?
(Işık hızı= 300000km)

a) 0,075

(b) 0,75

c) 7,5

d) 1

e) 10

(II. Öğrenme Birimi, Öğrenme Hedefi VIIA)

24. Aşağıda verilen denklemlerden hangisi sinüzoidal dalga denkleminin matematiksel ifadesidir?

a) $y=r\sin\left(\frac{t}{T}-\frac{x}{\lambda}\right)$

b) $y=r\sin 2\pi\left(\frac{t}{\lambda}-\frac{x}{T}\right)$

c) $y=7\sin\frac{2\pi}{T}\left(\frac{t}{T}-\frac{x}{\lambda}\right)$

d) $y=r\sin\left(\frac{2\pi}{T}-\frac{x}{\lambda}\right)$

(e) $y=r\sin 2\pi\left(\frac{t}{T}-\frac{x}{\lambda}\right)$

(II. Öğrenme Birimi, Öğrenme Hedefi IXA)

25. Düzlem dalgaların V_1 hızı ile yayıldıkları bir ortamdan V_2 hızı ile yayılacakları ikinci bir ortama vardıklarını düşünelim. α Geliş açısını, β kırılma açısını gösterirse aşağıdaki ifadelerden hangisi doğrudur?

a) $\dfrac{\text{Sin}\alpha}{\text{Sin}\beta} = \left(\dfrac{V_1}{V_2}\right)^2$

(b) $\dfrac{\text{Sin}\alpha}{\text{Sin}\beta} = \dfrac{V_1}{V_2}$

c) $\dfrac{\text{Sin}\alpha}{\text{Sin}\beta} = \dfrac{V_2}{V_1}$

d) $\dfrac{\text{Sin}\alpha}{\text{Sin}\beta} = \left(\dfrac{V_2}{V_1}\right)$

e) $\dfrac{\text{Sin}\alpha}{\text{Sin}\beta} = \left(\dfrac{V_1}{V_2}\right)^{1/2}$

(II. Öğrenme Birimi, Öğrenme Hedefi XIIA)

26. Doğrusal bir atma düz bir engelde yansımaktadir. Engel bir A açısı kadar dönerse, yansıyan atmanın dalga yüzü ne kadar sapar?

(a) 2 A

b) A

c) 90-A

d) $\dfrac{90-A}{2}$

e) $\dfrac{A}{2}$

(II. Öğrenme Birimi, Öğrenme Hedefi XIIIA)

27. Kaynaklara olan uzaklıkları farkı (x_2-x_1) olan noktaların maksimum genlikte titreşebilmesi için;

$$\cos\pi\left(\frac{x_2-x_1}{\lambda}\right) = 1$$

denklemi verilmektedir. Buna göre kaynaklara olan uzaklıkları farkı aşağıdakilerden hangisidir?

a) $(2k+1)\ \frac{\lambda}{3}$

(b) $k\lambda$

c) $(2k+1)\ \frac{\lambda}{2}$

d) $(2k-1)\ \frac{\lambda}{3}$

e) $(2k-1)\ \frac{\lambda}{2}$

(II. Öğrenme Birimi, Öğrenme Hedefi XVIA)

28. Aşağıdakilerden hangisi durakli dalgayı tanımlar?

a) Hareketsiz dalgalardır.

b) İki dalganın girişimine denir.

(c) Giden ve yansıyan dalgaların girişimi sonucunda meydana gelen dalga sistemine denir.

d) Titreşim doğrultusu yayılma doğrultusuna dik olan dalgalara denir.

e) Titreşim doğrultusu yayılma doğrultusunda olan dalgalara denir.

(II. Öğrenme Birimi, Öğrenme Hedefi XVIIA)

29. Yayılma hızı 3m/sn olan dalgalar sert bir engelde yansıyarak kararlı dalgalar oluşturuyorlar. Kaynağın frekansı 100 1/sn ise 6 cm uzunlukta kaç düğüm ve kaç karın noktası vardır?

(a) 5 düğüm, 4 karın noktası

b) 4 düğüm, 5 karın noktası

c) 4 düğüm, 4 karın noktası

d) 5 düğüm, 5 karın noktası

e) 2 düğüm, 3 karın noktası

(II. Öğrenme Birimi, Öğrenme Hedefi XVIIIA)

30. Aynı anda titreştirilen iki titreşim kaynağından çıkan ses dalgaların boyları 12 cm ve 11,9 cm dir. Sesin yayılma hızı 340 m/sn olduğuna göre, saniyede kaç vuruş meydana gelir?

a) 20

b) 23

(c) 25

d) 30

e) 32

(II. Öğrenme Birimi, Öğrenme Hedefi XXA)

31. Rüzgarda kuruyan, ipe asılmış bir havlunun hareketi nasıl bir atma örneğidir?

(a) Enine atma

b) Boyuna atma

c) Hem enine hem boyuna atma

d) Küresel atma

e) Yüzeysel atma

(II. Öğrenme Birimi, Öğrenme Hedefi IB)

32. "Ardışık iki dalga tepesi veya dalga çukuru arasındaki uzaklık" ifadesi aşağıdakilerden hangisini tanımlar?

a) Peryot

b) Frekans

c) Faz farkı

(d) Dalga boyu

e) Dalganın yayılma hızı

(II. Öğrenme Birimi, Öğrenme Hedefi IIIB)

33. Dalga hareketinde frekans, dalga boyu, hız ve peryot arasındaki ilişki için aşağıdaki ifadelerden hangisi doğru olabilir?

a) λ ile v^2 doğru orantılıdır.

b) λ ile v doğru orantılıdır.

c) T ile v doğru orantılıdır.

d) f ile T doğru orantılıdır.

(e) λ ile v doğru orantılıdır.

(II. Öğrenme Birimi, Öğrenme Hedefi IVB)

34. Bir frekans birimi olan kilosikl aşağıdakilerden hangisine eşittir?

a) $1/_{sn}$

b) $10/_{sn}$

(c) $1000/_{sn}$

d) $0.1/_{sn}$

e) $1/1000_{sn}$

(II. Öğrenme Birimi, Öğrenme Hedefi VIB)

35. Genliği 40 cm ve peryodu 1 sn, yayılma hızı 2 cm/sn olarak verildiğine göre dalga merkezinden çıkan dalgaların kaynaktan x kadar uzakta bulunan P noktasındaki hareket denklemi aşağıdakilerden hangisidir?

a) $S_p = 40\ Sin\pi(t-x)$

b) $S_p = 20\ Sin\pi(t-x)$

(c) $S_p = 40\ Sin2\pi(t-x/2)$

d) $S_p = 40\ Sin2\pi(t-x)$

e) $S_p = 20\ Sin2\pi(t-x)$

(II. Öğrenme Birimi, Öğrenme Hedefi XB)

36. Bir titreşim kaynağı S= 20 Sin5πt(CGS) denklemine göre titreşmektedir. Kaynaktan yayılan dalgaların boyu 40 cm'dir. Kaynaktan x= 20cm. uzakta bulunan bir A noktasında sırasıyla peryot, yayılma hızı ve faz farkı, aşağıdakilerden hangisine eşittir?

a) (0,4, 200, 2π)

(b) (0,4, 100, π)

c) (0,2, 100, 2π)

d) (0,4, 200, π)

e) (0,2, 200, 2π)

(II. Öğrenme Birimi, Öğrenme Hedefi XIB)

37. Doğrusal bir su dalgası, düz bir sınırda birdenbire derinleşen ortamın derin kısmından sığ kısmına geçiyor. Dalganın derin kısmındaki yayılma hızı 20 cm/sn sığ kısmındaki hızı da 15 cm/sn olarak ölçülüyor. Sığ kısmın, derin kısma göre kırılma indisi ne kadardır?

a) 1/4

b) 4/7

c) 3/4

d) 7/4

(e) 4/3

(II. Öğrenme Birimi, Öğrenme Hedefi XIVB)

38. Kaynaklara olan uzaklığı x_1= 60cm ve x_2= 84cm olan bir P noktası maksimum genlikte titreşmektedir. Buna göre dalga boyu aşağıdakilerden hangisidir?

a) 48

b) 84

c) 60

d) 140

(e) 24

(II. Öğrenme Birimi, Öğrenme Hedefi XVIB)

39. Yan yana duran ve aynı zamanda ses veren iki kaynaktan birincisinin frekansı 440'dir. Bir kişi 14,7 sn'de 50 vuru sayıyor. İkinci kaynağın frekansı nedir?

a) 433,6

(b) 436,6

c) 443,6

d) 446,6

e) 453,6

(II. Öğrenme Birimi, Öğrenme Hedefi XXB)

40. Bir köprüden uygun adım askerler geçmektedir. Köprünün bir süre sonra yıkılmasını aşağıdaki olaylardan hangisi açıklar?

a) Vuru

b) Batman

c) Girişim

(d) Rezonans

e) Huyghens prensibi

(II. Öğrenme Birimi, Öğrenme Hedefi XXIB)

41. Bir titreşimin ses olarak duyulabilmesi için aşağıdaki koşullardan hangisi olmalıdır?

a) Ultra-Ses olması gerekir.

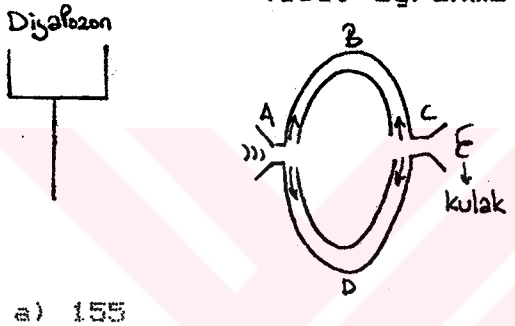
b) Enfra-Ses olması gerekir.

c) Dalgalar halinde yayılması gerekir.

(d) Frekanslarının 20 ile 20000 sn^{-1} arasında olması gerekir.

e) Frekanslarının 20 sn^{-1}den küçük, 20000 sn^{-1}den büyük olması gerekir.

(III. Öğrenme Birimi, Öğrenme Hedefi IIA)

42. 

Şekilde iç içe geçmiş iki borudan ABC yolu ADC yoluna eşittir. Alttaki boru 1 m çekildiğine göre diyapozonun frekansı aşağıdakilerden hangisidir?

a) 155

b) 160

(c) 170

d) 187

e) 203

(III. Öğrenme Birimi, Öğrenme Hedefi IVA)

43. Havada sesin yayılma hızı 330 $m/_{sn}$ verildiğine göre sesin havaya göre yoğunluğu 1,21 olan bir gazdaki yayılma hızı kaç $m/_{sn}$ dir?

a) 264

(b) 300

c) 330

d) 363

e) 440

(III. Öğrenme Birimi, Öğrenme Hedefi VIA)

44. Aşağıdaki ses veren tellerin kanunlariyla ilgili ifadelerden hangisi doğrudur?

a) Titreşen bir telde ana sesin frekansı; telin boyu ile doğru orantılıdır.

b) Titreşen bir telde ana sesin frekansı; teli geren kuvvet ile doğru orantılidır.

(c) Titreşen bir telde ana sesin frekansı; telin boyca yoğunluğunun karekökü ile ters orantılıdır.

d) Titreşen bir telde ana sesin frekansı; teli geren kuvvetin karekökü ile ters orantılıdır.

e) Titreşen bir telde ana sesin frekansı; telin boyunun karesi ile ters orantılıdır.

(III. Öğrenme Birimi, Öğrenme Hedefi XA)

45. Bir tel 4 kg.lik bir kuvvetle gerildiğinde frekansı 800 olan ana ses meydana geliyor. Aynı tel 6.25 kg.lik kuvvetle gerildiğinde ana sesin frekansı ne olur?

a) 640 sn^{-1}

b) 1100 sn^{-1}

c) 900 sn^{-1}

d) 850 sn^{-1}

(e) 1000 sn^{-1}

(III. Öğrenme Birimi, Öğrenme Hedefi XIA)

46. 20 deliği bulunan bir siren iki dakikada 1275 devir yapıyor. Meydana gelen sesin dalga boyu kaç m'dir? (v= 340 $m/_{sn}$)

a) 1,8 m

(b) 1,6 m

c) 2 m

d) 1,4 m

e) 2,2 m

(III. Öğrenme Birimi, Öğrenme Hedefi XIVA)

47. Kapalı bir ses borusu içinde aralarında 20 cm aralık olan 2 düğüm noktası oluşuyor. Borunun verdiği sesin dalga boyu nedir?

a) 30 cm

b) 20 cm

(c) 40 cm

d) 10 cm

e) 50 cm

(III. Öğrenme Birimi, Öğrenme Hedefi XVIA)

48. Açık bir ses borusunun verdiği ana sesin ilk üst tonu (Sesin ikinci harmoniği), uzunluğu 45 cm olan kapalı bir ses borusunun verdiği ana sesin ilk üst tonuna eşittir. Buna göre açık ses borusunun uzunluğu kaç cm dir?

a) 15

b) 30

c) 45

(d) 60

e) 90

(III. Öğrenme Birimi, Öğrenme Hedefi XVIIA)

49. Bir ses cihazından farklı ortamlarda ses dalgaları yayılıyor.Buna göre aşağıdaki ifadelerden hangisi doğrudur?

(a) Katı ortam sesin en iyi yayıldığı ortamdır.

b) Katı ortam sesin en kötü yayıldığı ortamdır.

c) Vakumlu ortam sesin en iyi yayildığı ortamdır.

d) Gaz ortamı sesin en iyi yayıldığı ortamdır.

e) Gaz ortamında ses iletilemez.

(III. Öğrenme Birimi, Öğrenme Hedefi IIIB)

50. Bir S kaynağından çıkan ses dalgaları içlerinde hava bulunan SABO ve SDCO kollarından geçip vardıkları O noktasında minimum etki yapıyorlar. Bu durumun ardından gelen minimum sesi duymak için CD kolu 48 cm uzatılırsa kaynaktan çıkan ses dalgalarının boyu ve frekansı ne olur? [(cm), f(sn^{-1})]

a) (48, 548)

(b) (48, 696)

c) (96, 548)

d) (96, 696)

e) (24, 696)

(III. Öğrenme Birimi, Öğrenme Hedefi IVB)

51. Esneklik katsayıları aynı yoğunluklari $d_1 > d_2 > d_3$ olarak değişen üç katı maddenin yayılma hızları arasındaki ilişki için aşağıdakilerden hangisi doğrudur?

a) $V_1 > V_2 > V_3$

(b) $V_3 > V_2 > V_1$

c) $V_1 > V_3 > V_2$

d) $V_2 > V_1 > V_3$

e) $V_1 = V_2 = V_3$

(III. Öğrenme Birimi, Öğrenme Hedefi IVB)

52. f= frekans, F= Germe kuvveti, μ= boyca yoğunluk, l= boy olmak üzere $f = \frac{1}{2l}\sqrt{\frac{F}{\mu}}$ ifadesi aşağıdakilerden hangisini hesaplamada kullanılır?

a) Katılarda yayılan bir sesin frekansını

b) Sıvılarda yayılan bir sesin frekansını

c) Gazlarda yayılan bir sesin frekansını

d) Açık ses borusunun frekansını

(e) Titreşen bir telin frekansını

(III. Öğrenme Birimi, Öğrenme Hedefi IXB)

53. Bir tel ana sesinin frekansı 1000 $\frac{1}{sn}$ olacak şekilde titreşmektedir. Aynı cins maddeden yapılmış, fakat çapı, uzunluğu ve genliği birincinin 2 katı olan başka bir telin ana sesinin frekansı kaç $\frac{1}{sn}$ dir?

a) $175.\sqrt{3}$

(b) $250.\sqrt{2}$

c) $240.\sqrt{5}$

d) $150.\sqrt{2}$

e) 250

(III. Öğrenme Birimi, Öğrenme Hedefi XIB)

54. Boyu 60 cm ve 1 cm'sinin kütlesi 0,5 gr olan bir tel 7,2 Newtonluk kuvvetle gerilmiştir. Bu telin 4'üncü harmoniğinin frekansı kaç $1/_{sn}$'dir?

a) 4

(b) 40

c) 400

d) 20

e) 200

(III. Öğrenme Birimi, Öğrenme Hedefi XIIB)

55. Ana sesi f_1, kapalı ses borularında ana sesin harmonikleri $f_k = k.f_1$ ve açık ses borularında ana sesin harmonikleri $f_n = n.f_1$ olarak verilmektedir. Buna göre "k" ve "n" için aşağıdakilerden hangisi doğrudur?

a) k= 1,2,3,4 ..... n= 2,4,6,8 .....

b) k= 2,4,6,8 ..... n= 1,2,3,4,5 .....

c) k= 1,3,5,7 ..... n= 2,4,6,8 .....

d) k= 1,2,3,4 ..... n= 1,3,5,7 .....

(e) k= 1,3,5,7 ..... n= 1,2,3,4,5 .....

(III. Öğrenme Birimi, Öğrenme Hedefi XVB)

56. Açık uçlu bir org borusunun ana frekansı 340 $1/_{sn}$ dir. Kapalı bir org borusunun ana frekanstan sonraki ilk frekansı yukarıdaki açık org borusunun ana frekanstan sonra çıkabildiği ilk frekansına eşittir. Kapalı org borusunun uzunluğu kaç cm dir?
(Sesin havadaki yayılma hızı 340 $m/_{sn}$)

a) 25

b) 27,5

(c) 37,5

d) 30

e) 50

(III. Öğrenme Birimi, Öğrenme Hedefi XVIIB)

57. Bir tel çerçeveden geçen magnetik akı 0,02 saniyede 620000 maxwell'den 20000 maxwell'e düşüyor. Çerçevede meydana gelen indüksiyon e.m.k.'i kaç volttur?

a) 3000

b) 300

c) 30

d) 3

(e) 0,3

(IV. Öğrenme Birimi, Öğrenme Hedefi IIIA)

58. Kapalı bir devreden geçen magnetik akı
$\emptyset = 8.10^{5}t^{2} + 10^{4}t + 10^{5}$ bağıntısına göre değişiyor. Yukarıdaki denklemde (t) saniyede, $\emptyset$ (maxwell) ise 3. saniye sonunda devrede oluşan indüksiyon e.m.k.'i kaç volttur?

(a) 0,058

b) 0,048

c) 0,01

d) 0,022

e) 0,026

(IV. Öğrenme Birimi, Öğrenme Hedefi IVA)

59. Self indüksiyon katsayısı 500 milihenry olan 750 sarımlı bir makaradan geçen akım, 0,4 saniyede 8 Amper'den 16 amper'e yükseliyor. Meydana gelen özindüksiyon e.m.k.'i kaç volttur?

(a) -10 volt

b) -15 volt

c) -12 volt

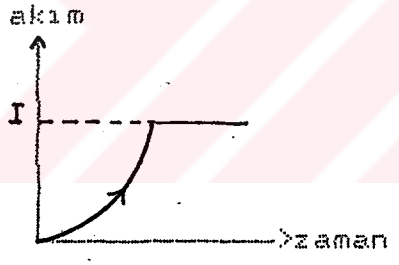
d) -5 volt

e) -8 volt

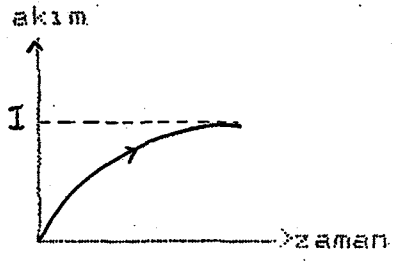
(IV. Öğrenme Birimi, Öğrenme Hedefi VIA)

60. "Bir üreteç devresindeki anahtar kapatıldığı zaman bu devredeki akımın şiddeti sıfırdan belli bir I değerine kadar yükselir. Bu sırada devredeki akımın artışına karşı koyacak yönde bir özindüksiyon e.m.k.'i doğarak, akımın normal değerine yükselişini geciktirir." Bu durumda anahtar açılıncaya kadar geçen zamana göre yukarıdaki ifadenin grafiği aşağıdakilerden hangisidir?

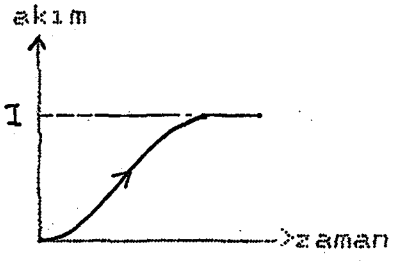
a)



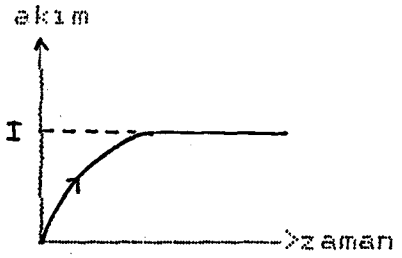
b)



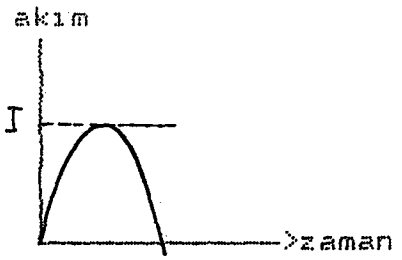
c)



(d)



e)



(IV. Öğrenme Birimi, Öğrenme Hedefi VIIIA)

61. Aşağıdaki ifadelerden hangisi indüksiyon akımının elde edilişi ile ilgili kanunu tanımlar?

a) İndüksiyon elektro motor kuvvetinin değişim süresi, kendisini meydana getirmekte olan indüksiyon akımının süresi kadardır.

b) İndüksiyon elektro motor kuvvetinin değişim süresi, kendisini meydana getirmekte olan magnetik kuvvetin değişim süresi kadardır.

c) Magnetik kuvvetin değişim süresi, kendisini meydana getirmekte olan indüksiyon akımının süresi kadardır.

d) Magnetik kuvvetin değişim süresi, kendisini meydana getirmekte olan magnetik akı değişim süresi kadardır.

(e) İndüksiyon akımının süresi, kendisini meydana getirmekte olan magnetik akı değişim süresi kadardır.

(IV. Öğrenme Birimi, Öğrenme Hedefi IB)

62. 40 sarımlı bir çerçevenin her sarımının yüzölçümü 800 cm^2 dir. Ve çerçeve alan şiddeti 1000 gauss olan bir magnetik alan içine dik durumdan 90^o dönerek kuvvet çizgilerine paralel duruma geldiği zaman, meydana gelen indüksiyon e.m.k.'i kaç volttur?

a) 6,9

b) 19,2

c) 18,6

(d) 25,6

e) 12,3

(IV. Öğrenme Birimi, Öğrenme Hedefi IIIB)

63. Bir makaranın özindüksiyon katsayısı 0,12 Henry'dir. Bu makaradan geçen akım 2 saniyede 10 amperden 50 ampere çıktığına göre devrede ne değerde bir özindüksiyon e.m.k.'ti oluşur?

a) -8,4 volt

b) -1,6 volt

(c) -2,4 volt

d) -3 volt

e) -2 volt

(IV. Öğrenme Birimi, Öğrenme Hedefi VIB)

64. Bir makaradan geçen akım şiddeti 0,8 saniyede 15 amper'den 9 amper'e düşüyor. Bu esnada 12 volt'luk bir indüksiyon e.m.k. meydana geliyor. Makaranın özindüksiyon katsayısı kaç milihenry'dir?

a) 1,6

(b) 1600

c) 16

d) 160

e) 16000

(IV. Öğrenme Birimi, Öğrenme Hedefi VIIB)

65. Alternatif akımın etkin şiddetini aşağıdaki ifadelerden hangisi tanımlar?

a) Kendisine değer olarak eşdeğer olan doğru akım şiddetine denir.

b) Kendisine yön olarak eşdeğer olan doğru akım şiddetine denir.

c) Kendisine şiddet olarak eşdeğer olan doğru akım şiddetine denir.

(d) Kendisine ısı bakımından eşdeğer olan doğru akım şiddetine denir.

e) Kendisine şiddet olarak eşdeğer fakat yön olarak ters olan doğru akım şiddetine denir.

(V. Öğrenme Birimi, Öğrenme Hedefi IVA)

66. Sadece sığa bulunan bir devrede akım ile potansiyel arasındaki faz farkı aşağıdakilerden hangisidir?

a) 0

b) $\pi/4$

(c) $\pi/2$

d) π

e) 2π

(V. Öğrenme Birimi, Öğrenme Hedefi VIA)

67. Sığası 20 mikrofarat olan kondansatörün indükleme direnci aşağıdakilerden hangisidir?

$\left(f = 50 \dfrac{1}{Sn}\right)$

a) $X_c = \dfrac{1}{\pi . 50 . 20}$

b) $X_c = \dfrac{1}{2\pi . 50 . 20}$

(c) $X_c = \dfrac{10^6}{2\pi . 50 . 20}$

d) $X_c = \dfrac{10^4}{\pi . 50 . 20}$

e) $X_c = \dfrac{10^3}{2\pi . 50 . 20}$

(V. Öğrenme Birimi, Öğrenme Hedefi IXA)

68. Sığaları C_1 ve C_2 olan iki paralel kondansatörden ve bir dirençten oluşan devrenin empedansı aşağıdakilerden hangisidir?

a) $z = \sqrt{R + (C_1 + C_2)^2}$

b) $z = \sqrt{R^2 + (C_1 + C_2)^2}$

c) $z = \sqrt{R^2 + \left(\dfrac{1}{2\pi f C_1 . C_2}\right)^2}$

d) $z = \sqrt{R^2 + \left(\dfrac{C_1 . C_2}{2\pi f}\right)^2}$

(e) $z = \sqrt{R^2 + \left(\dfrac{1}{2\pi f (C_1 + C_2)}\right)^2}$

(V. Öğrenme Birimi, Öğrenme Hedefi XIA)

69. Özindükleme katsayısı 0,4 Henry olan bobin, sığası 20 mikrofarat olan kondansatör ve 25 ohmluk direnç seri bağlandığında empedansı aşağıdakilerden hangisi olur?

$\left(f = 50 \dfrac{1}{Sn}\right)$

(a) $z = \sqrt{625 + \left(\dfrac{10^4}{6,28 . 50 . 20} - 6,28 . 50 . 0,4\right)^2}$

b) $z = \sqrt{25 + \left(\dfrac{1}{6,28 . 50 . 20} - 6,28 . 50 . 0,4\right)^2}$

c) $z = \sqrt{625 + \left(\dfrac{10^4}{3,14 . 50 . 20} - 3,14 . 50 . 0,4\right)^2}$

d) $z = \sqrt{25 + \left(\dfrac{1}{3,14 . 50 . 20} - 6,28 . 50 . 0,4\right)^2}$

e) $z = \sqrt{625 + \left(\frac{10^4}{3,28.50.20} - 3,14.50.0,4\right)^2}$

(V. Öğrenme Birimi, Öğrenme Hedefi XIIA)

70. Bir devreye uygulanan alternatif gerilim ve akım denklemi V= 5 Sin 5t ve I= 2 Sin 5t şeklindedir. Devrenin güç çarpanı aşağıdakilerden hangisidir?

a) 0

b) $\frac{1}{2}$

c) $\frac{\sqrt{3}}{2}$

d) $\frac{\sqrt{2}}{2}$

(e) 1

(V. Öğrenme Birimi, Öğrenme Hedefi XIIIA)

71. Bir elektrik aracına V= 220 Sin wt gerilim uygulanınca $I = 4 \text{ Sin } (wt - \frac{\pi}{6})$ akımı geçmektedir. Aracın gücü kaç vattır?

a) 440

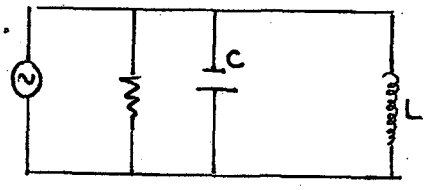
b) 880

c) $440\sqrt{3}$

d) $880\sqrt{3}$

(e) $220\sqrt{3}$

(V. Öğrenme Birimi, Öğrenme Hedefi XIVA)

72. 

Yandaki devrede anakol akımı aşağıdaki ifadelerden hangisidir? (R= Direnç, C= Kondansatör, L= İndüktans)

a) $I^2(\text{anakol}) = I_R^2 + I_C^2 + I_C^2$

b) $I^2(\text{anakol}) = I_R^2 + (I_C^2 + I_L^2)^2$

c) $I^2(\text{anakol}) = I_R^2 + I_C^2 + I_L^2$

(d) $I^2(\text{anakol}) = I_R^2 + (I_C + I_L)^2$

e) $I^2(\text{anakol}) = I_R^2 + (I_R + I_L)^2$

(V. Öğrenme Birimi, Öğrenme Hedefi XVIA)

73. Bir alternatif akım devresinde maksimum akım şiddeti 9 amp olarak verildiğine göre bu devrenin herhangi bir anındaki akım şiddeti değerini veren denklem aşağıdakilerden hangisidir?

a) $E = 3\sqrt{3}\ \text{Sin}\omega t$

b) $E = 3\ \text{Sin}\omega t$

(c) $E = 9\ \text{Sin}\omega t$

d) $E = 9\sqrt{2}\ \text{Sin}\omega t$

e) $E = 18\ \text{Sin}\omega t$

(V. Öğrenme Birimi, Öğrenme Hedefi IIB)

74. Bir alternatif akım devresinde maksimum akım şiddeti 4 amp. olduğuna göre etkin akım şiddeti aşağıdakilerden hangisidir?

a) 2 amp.

(b) $2\sqrt{2}$ amp.

c) 4 amp.

d) $4\sqrt{2}$ amp.

e) 16 amp.

(V. Öğrenme Birimi, Öğrenme Hedefi VB)

75. Sadece bobin bulunan bir devrede akım ile potansiyel arasındaki faz farkı aşağıdakilerden hangisidir?

(a) 0

b) $\pi/4$

c) $\pi/3$

d) $\pi/2$

e) π

(V. Öğrenme Birimi, Öğrenme Hedefi VIB)

76. 7 mikrofaratlık bir sığaya sahip olan kondansatörün indükleme direnci aşağıdakilerden hangisidir?

$\left(f = \frac{500}{22}\ sn^{-1},\ \pi = \frac{22}{7}\right)$

a) $X_c = 10^{-3}$

(b) $X_c = 10^{3}$

c) $X_c = 1$

d) $X_c = 10^{6}$

e) $X_c = 10^{-6}$

(V. Öğrenme Birimi, Öğrenme Hedefi IXB)

77. Sığaları 2 ve 1,5 farad olan 2 tane paralel bağlı kondansatörden ve 5 ohm'luk bir dirençten oluşan devrenin empedansı aşağıdakilerden hangisidir? ($\pi = 22/7$)

(a) $z^2 = 25+(\pi f)^{-2}$

b) $z^2 = 25+(\pi f)^2$

c) $z^2 = \sqrt{25+(\pi f)^{-2}}$

d) $z^2 = \sqrt{25+(\pi f)^2}$

e) $z^2 = 5+(\pi f)^2$

(V. Öğrenme Birimi, Öğrenme Hedefi XIB)

78. Bir alternatif akım devresinin direnci 3 ohm, empedansı 6 ohm olduğuna göre güç çarpanı aşağıdakilerden hangisidir?

a) $\frac{\sqrt{2}}{2}$

b) 2

(c) 0,5

d) π/3

e) π/2

(V. Öğrenme Birimi, Öğrenme Hedefi XIIIB)

79. Bir ütüye V= 110 Sin(wt) gerilimi uygulanınca $I= 6\ Sin(wt - \frac{\pi}{3})$ akımı geçmektedir. Ütünün gücü kaç vattır?

a) 110

(b) 165

c) 220

d) 330

e) 660

(V. Öğrenme Birimi, Öğrenme Hedefi XIVB)

80. Paralel bağlı bir direnç, indüktans ve kondansatörden oluşan bir devrede sırasıyla bu elemanlardan geçen akımlar I_R= 4A, I_C= 7A, I_L= 4A olduğuna göre anakol akımı aşağıdakilerden hangisidir?

a) 3A

b) 4A

(c) 5A

d) 6A

e) 12A

(V. Öğrenme Birimi, Öğrenme Hedefi XVIB)

SUBJECT AREA: CHEMISTRY

KİMYA ÖN-TEST

1. Metanol iki derece yükseltgenirse hangi madde oluşur?

   a) Metil Alkol

   b) Oksi Metan

   (c) Formik Asit

   d) Dimetil Keton

   e) Asetik Asit

2. Aşağıdaki maddelerden hangisi Fehling eriğine indirgen olarak etki eder?

   (a) $H - \underset{\displaystyle H}{\overset{\displaystyle |}{C}} = O$

   b) $CH_3 - \underset{\displaystyle CH_3}{\overset{\displaystyle |}{C}} = O$

   c) $CH_3 - \underset{\displaystyle OH}{\overset{\displaystyle |}{C}} = O$

   d) $CH_3 - \underset{\displaystyle OC_2H_5}{\overset{\displaystyle |}{C}} = O$

   e) $C_2H_5 - \underset{\displaystyle C_2H_5}{\overset{\displaystyle |}{C}} = O$

3. Etil alkolün iki derece yükseltgenmesinden elde edilen maddenin etil alkolle tepkimesinden hangi madde oluşur?

   a) Asetik Asit

   b) Di Etil Eter

   c) Di Etil Keton

   d) Etil Formiyat

   (e) Etil Asetat

4. Bir mol metil alkol ve bir mol etil alkolden 1 mol su çıkarılırsa aşağıdaki hangi madde oluşur?

   a) Metil Etil Keton

   (b) Metil Etil Eter

   c) Etil Asetat

   d) Formaldehit

   e) Asetik Asit

5. Propene su katılmasıyla elde edilen maddenin 1° yükseltgenmesinden elde edilecek madde H_2 ile indirgendiğinde aşağıdaki hangi madde oluşur?

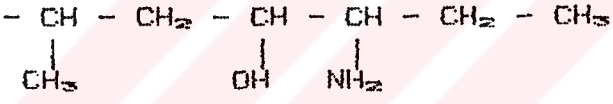
   a) Etanol

   (b) Propanan

   c) Propanal

   d) Propil Alkol

   e) İzo Propil Alkol

6.  formülü ile gösterilen maddenin adı nedir?

   a) 2 Metil 4 Hidroksi 5 Amino Oktan

   b) 3 Amino 4 Oksi 6 Metil Heptan

   (c) 2 Metil 4 Oksi 5 Amino Heptan

   d) 4 Oksi 5 Amino Oktan

   e) 2 Metil 4 Oksi 5 Amino Hepzan

7. 3 Metil Bütan - 2 - ol'ün yükseltgenmesinden hangi madde oluşur?

   a) 3 Metil Bütanoik Asit

   b) 3 Metil Bütanal

   (c) 3 Metil Bütan -2- on

   d) 2 Metil Bütanoik Asit

   e) 3 Metil Pentanoik Asit

8. Asetilene su katılmasından oluşan maddenin 1'e yükseltgenmesinden hangi madde oluşur?

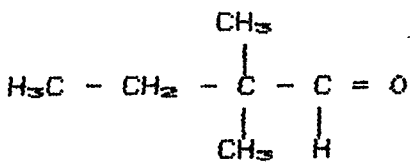
a) Etil Asetat

(b) Asetik Asit

c) Etil Propil Keton

d) Aset Aldehit

e) Aseton

9.  formülü ile gösterilen madde aşağıdakilerden hangisidir?

(a) 2,2 di metil Bütanal

b) 2,2 di metil Bütanon

c) 2,2 di metil Bütanoik Asit

d) 2,2 di metil Bütanol

e) 2,2 di metil Büten-1

10. Her eter bir alkolun yapı izomeridir. Metil etil eter aşağıdaki alkollerden hangisinin yapı izomeridir?

a) Butil Alkol

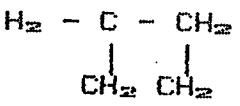
b) Etil Alkol

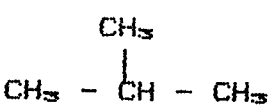
(c) Propil Alkol

d) İzobutil Alkol

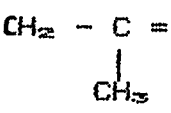
e) Pentil Alkol

11. Aşağıdakilerden hangisi bütanın izomeridir?

a) 

(b) 

c) $CH_3 - CH = CH - CH_3$

d) 

e) $CH_2 = CH - CH = CH_2$

12. Aşağıdaki hangi iki madde çifti birbirinin izomeridir?

a) Pentanol - di etil eter

b) Dimetil eter - pentanol

c) Asetik asit - asetal dehit

(d) Aseton - Propanal

e) Etil metil eter - propanal

13. Würtz sentezi ile aşağıdakilerden hangisi elde edilebilir?

a) CH_4

(b) C_2H_6

c) C_2H_4

d) C_6H_4

e) C_3H_6

14. Aşağıdaki denklemlerden hangisi doğrudur?

a) $CuO + CH_3O \longrightarrow H - \overset{O}{\overset{\|}{C}} - OH + Cu + H_2O$

b) $5CH_3OH + 4KMnO_4 + 6H_2SO_4 \longrightarrow 5CO_2 + 2K_2SO_4 + 11H_2O$

(c) $Ag_2) + H - \underset{H}{\overset{|}{C}} = O \longrightarrow 2Ag + H - \underset{OH}{\overset{|}{C}} = O$

d) $CH_3 - \underset{OH}{\overset{|}{C}} = O + 1/2O_2 \longrightarrow CH_3 - \underset{H}{\overset{|}{C}} = O$

e) $CH_3CH_2OH + H_2 \longrightarrow CH_3\overset{H}{\overset{|}{C}} = O$

15. $CH_3 - \underset{OC_3C_7}{\overset{|}{C}} = O$ formülü ile gösterilen bileşik hangi madde çiftinden elde edilir?

a) $C_3H_7 - \underset{H}{\overset{|}{C}} = O + CH_3 - OH$

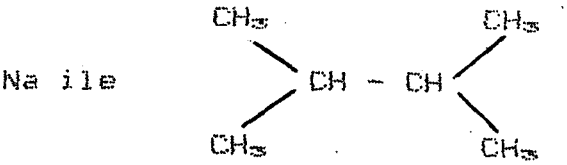
(b) $C_3H_7 - \underset{OH}{\overset{|}{C}} = O + CH_3 - OH$

c) $CH_3 - \underset{H}{\overset{|}{C}} = O + C_3H_7 - OH$

d) $CH_3 - \underset{OH}{\overset{|}{C}} = O + C_3H_7 - COOH$

e) $CH_3 - \underset{OH}{\overset{|}{C}} = O + C_3H_7 - OH$

16. Würtz sentezinin denklemi genel olarak
$2R-Br+2Na \longrightarrow R-R+2NaBr$ şeklindedir ve alkanların elde edilmesinde yararlanılır. Aşağıdaki alkil halojenürlerinden hangisi



hidrokarbonunu verir?

(a) 2 Brom Propan

b) 1 Brom propan

c) 2 Brom Bütan

d) 2 Brom Pentan

e) 2,4 Di Brom Hegzan

17. Aşağıdakilerden hangisi hegzanın izomeridir?

a) 2,3 di etil bütan

b) 2,2 di etil bütan

c) 2 etil 3 metil bütan

(d) 2 metil pentan

e) 3 metil heptan

18. Urotropin denilen hegzametilen tetramin aşağıdaki hangi iki madde çiftinden elde edilir?

a) Aset aldehit + fosfor

b) Aset aldehit + amonyak

c) Formaldehit + fenol

(d) Formaldehit Amonyak

e) Asetik asit + Etil alkol

19. NŞA 1 mol C_2H_6 ve 1 mol C_2H_4 gaz karışımı aşırı miktarda $KMnO_4$ çözeltisiyle tepkime verdiğinde arta kalan gazın hacmi kaç litre olur?

a) 20

b) 11,2

(c) 22,4

d) 10

e) 5,6

20. Molekül ağırlığı 46 gram olan bir mono alkolden, mol ağırlığı 88 gram olan bir ester oluşuyor. Buna göre kullanılan asidin molekül ağırlığı nedir?

a) 42

b) 44

(c) 60

d) 70

e) 74

21. 10,9 gram Etil Bromürden önce alkol, daha sonra aldehit elde ediliyor. Elde edilen aldehit kaç gramdır? (Br: 80, C: 12)

a) 13,7

b) 8,6

c) 5,8

(d) 4,4

e) 3

22. Eşit mol sayısında etan, etilen ve asetilen gazlarını içeren bir karışımın 3 litresi yakıldığında başlangıçtaki koşullarda kaç litre CO_2 oluşur?

a) 2

b) 3

c) 4

(d) 6

e) 9

23. Bir doymamış hidrokarbonun 0,2 molü yandığında 0,6 mol CO_2 oluşuyor. Bu bileşiğin 0,2 molünün bromla tepkimesinde 0,4 mol Br_2 harcandığına göre formülü aşağıdakilerden hangisidir?

a) C_3H_8

b) C_3H_6

(c) C_3H_4

d) C_6H_{12}

e) C_6H_6

KIMYA ÖN-TEST PARELELİ

1. Etanol iki derece yükseltgenirse hangi madde oluşur?

   a) Metil Alkol

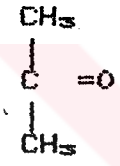
   b) Dietil Keton

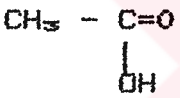
   (c) Asetik Asit

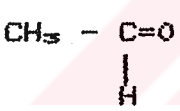
   d) Formik Asit

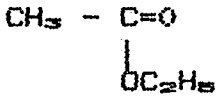
   e) Dimetil Keton

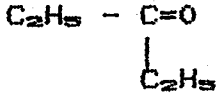
2. Aşağıdaki maddelerden hangisi Fehling eriğine indirgen olarak etki eder?

   a) 

   b) 

   (c) 

   d) 

   e) 

3. Metanolün iki derece yükseltgenmesinden elde edilen maddenin Etanolle tepkimesinden hangi madde oluşur?

   a) Metil Asetat

   b) Etil Asetat

   c) Metil-Etil Eter

   (d) Etil Formiyat

   e) Metil Formiyat

4. 2 mol etil alkolden bir mol su çıkarılırsa aşağıdaki hangi madde oluşur?

   a) Dietil Keton

   b) Etil Asetat

   c) Asetik Asit

   (d) Dietil Eter

   e) Aset Aldehit

5. Etilene su katılmasıyla elde edilen maddenin iº yükseltgenmesiyle elde edilecek madde Hidrojenle indirgendiğinde hangi madde oluşur?

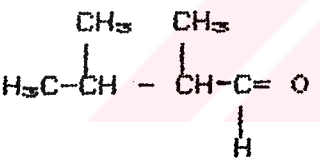
   (a) Etanol

   b) Propanon

   c) Propanal

   d) Propil Alkol

   e) Etanal

6.  formülü ile gösterilen maddenin adı aşağıdakilerden hangisidir?

   a) 2,3 dimetil Hegzanal

   b) 2,3 dimetil Hegzanon

   (c) 2,3 dimetil Bütanal

   d) 2,3 dimetil Bütanoik Asit

   e) 2,3 dimetil Bütanon

7. Pentan Würtz sentezine göre hangi madde çiftinden elde edilir?

   a) Etil Bromür + Metil Bromür

   b) Propil Bromür + Metil Bromür

   c) Butil Bromür + Etil Bromür

   d) Etil Bromür + Etil Bromür

   (e) Etil Bromür + Propil Bromür

8. Aldehit sınıfı bir bileşiğin 3 gramının Ag_2O ile tepkimesinden 21,6 gram açığa çıkmaktadır. Bu aldehit aşağıdakilerden hangisidir?
(Ag= 108, C= 12, H= 1, O= 16)

   a) $CH_3-\underset{\displaystyle H}{\overset{\displaystyle |}{C}}=O$

   (b) $H-\underset{\displaystyle H}{\overset{\displaystyle |}{C}}=O$

   c) $C_2H_5-\underset{\displaystyle H}{\overset{\displaystyle |}{C}}=O$

   d) $C_3H_7-\underset{\displaystyle H}{\overset{\displaystyle |}{C}}=O$

   e) $C_4H_9-\underset{\displaystyle H}{\overset{\displaystyle |}{C}}=O$

9. Her eter bir alkolun izomeridir. Metil propil eter aşağıdaki alkollerden hangisinin yapı izomeridir?

a) Pentil Alkol

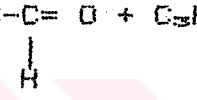
b) Propil Alkol

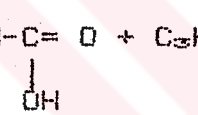
(c) Bütil Alkol

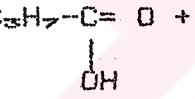
d) Etil Alkol

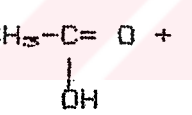
e) İzopropil Alkol

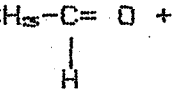
10.  formülü ile gösterilen bileşik hangi madde çiftinden elde edilir?

a) 

(b) 

c) 

d) 

e) 

11. 1,2 gram ($CH_4+C_2H_5-OH$) karışımı Na metali ile tepkimeye girdiğinde, N.Ş.A. 224 cm^3 H_2 gazı elde ediliyor. Karışımdaki metan kaç gramdır?

(a) 0,28

b) 0,92

c) 0,46

d) 0,56

e) 0,16

12. Aşağıdakilerden hangisi Etil Bütil Ketondur?

a) $C_2H_5-O-C_4H_9$

(b) $C_4H_9-C(=O)-C_2H_5$

c) $C_4H_9-C(=O)-H$

d) $C_2H_5-O-C_2H_5$

e) $C_2H_5-C(=O)-OC_4H_9$

13. Pentanol'un izomeri aşağıdakilerden hangisidir?

a) Dimetil Eter

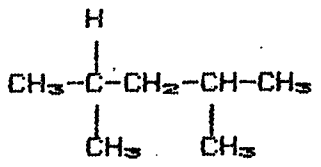
b) Dietil Eter

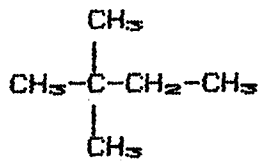
c) Metil Etil Eter

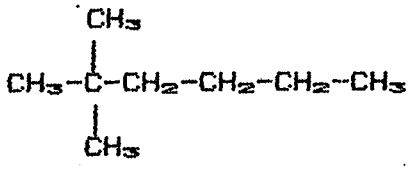
(d) Etil Propil Eter

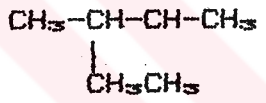
e) Metil Propil Eter

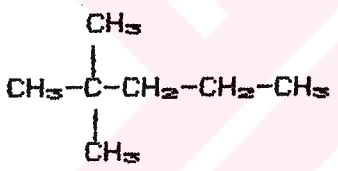
14. Aşağıdakilerden hangisi 2,2 dimetil Pentandır?

a) 

b) 

c) 

d) 

(e) 

15. 6,4 gram Kalsiyum Karbürden (CaC_2) elde edilen asetilenin tam olarak yanması için N.Ş.A. kaç litre Oksijen gereklidir? (Ca=40, C=12)

a) 2,8

b) 4,48

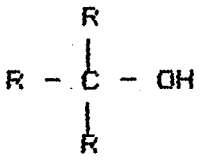
(c) 5,6

d) 11,2

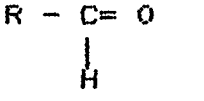
e) 22,4

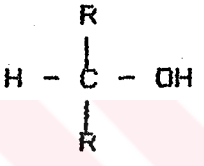
16. Aşağıda genel formülleri verilen bileşik sınıflarından hangisi yükseltgendiğinde bir keton oluşur?

a) $R - CH_2 - OH$

b)


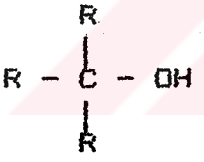
c) $R - O - R$

(d)


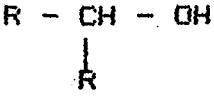
e)


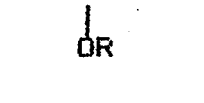
17. Aldehitler indirgendiklerinde aşağıdaki bileşiklerden hangisi oluşur?

(a) $R - CH_2 - OH$

b)


c) $R - O - R$

d)


e)


18. 2 mol Na metali ile 1 mol H_2 açığa çıkaran madde aşağıdakilerden hangisidir?

a) Etil Alkol

b) Propil Alkol

c) Gliserin

(d) Glikol

e) Asetik Asit

19. 23 gramlık Etil Alkol çözeltisindeki alkolün tümü asetik asitle tepkimeye girdiğinde 35,2 gr. ester oluştuğuna göre çözeltideki alkol yüzdesi nedir?
(Molekül ağırlıkları: Etil Alkol= 46, Etil Asetat= 88)

(a) 80

b) 70

c) 60

d) 50

e) 40

20. $CH_3 - \underset{\underset{NH_2}{|}}{CH} - CH_2 - \underset{\underset{CH_3}{|}}{CH} - \underset{\underset{OH}{|}}{CH} - CH_2 - CH_3$ formülü ile gösterilen maddenin adı nedir?

(a) 2 amino, 4 metil, 5 oksi heptan

b) 3 oksi, 4 metil, 6 amino heptan

c) 2 amino, 4 oksi, 6 metil oktan

d) 2 amino, 4 metil, 5 oksi oktan

e) 3 oksi, 6 amino oktan

21. 0,9 gr aldehit, fehlink çözeltisinden 4,29 gr Cu_2O çöktürüyor. Aldehitin formülü nedir?

a) CH_3CHO

(b) $H - CHO$

c) C_2H_5CHO

d) $C_5H_{11}CHO$

e) C_4H_9CHO

22. Würtz sentezi ile aşağıdaki hangi organik madde elde edilir?

a) C_3H_6O

b) C_5H_{10}

c) C_3H_4

d) C_7H_{16}

b) C_8H_{17}

23. Aşağıdaki hangi madde çifti birbirinin izomeridir?

a) bütanol - di metil eter

b) asetik asit - formaldehit

(c) bütanon - bütanal

d) hegzan - hegzen

e) pentanal - pentanol

SUBJECT AREA: CHEMISTRY

There were 4 learning units to be covered for the Subject area of Chemistry in the second semester. These were:

Unit 7: Organic Carboxylic Acids

Unit 8: Esters

Unit 9: Aliphatic Ammonia Derivatives

Unit 10: Aromatic Compounds

In Chemistry, each unit constituted a learning task by itself. The 4 learning units were chosen from the textbook, Kimya Lise III Fen Kolu by Nurettin Baç and Münevver Baç, published Remzi Limited 1980.

I. ÖĞRENME BİRİMİ: ORGANİK ASİTLER

Öğrenme Hedefleri:

1. Öğrenciler verilen organik madde formülleri arasından organik asitlerin formülünü seçebilmelidirler.

2. Öğrenciler verilen asitler arasından organik asiti seçebilmelidirler.

3. Öğrenciler verilen bir asidi özel veya cenevre yöntemlerine göre adlandırabilmelidirler.

4. Öğrenciler verilen asitler arasından istenilen değerlikteki bir asidi seçebilmelidirler.

5. Öğrenciler bir değerli asitlerin kimyasal özelliklerinden faydalanarak verilen bir tepkimede oluşan maddeleri belirleyebilmelidirler.

6. Öğrenciler bir değerli asitlerin genel elde yöntemlerinden faydalanarak verilen bir tepkimede oluşacak maddeyi belirleyebilmelidirler.

7. Öğrenciler formik asidin kimyasal özelliklerinden faydalanarak verilen asitler arasından formik asidi seçebilmelidirler.

8. Öğrenciler formik asidin kimyasal özelliklerine dayanarak verilen bir tepkimede oluşan maddeyi belirleyebilmelidirler.

9. Öğrenciler formik asidin elde edilme yöntemlerinden faydalanarak bir tepkime sonucu oluşan maddeyi verilen maddeler arasından seçebilmelidirler.

10. Öğrenciler asetik asidin kimyasal özelliklerine dayanarak verilen bir tepkime sonucu oluşan maddeyi belirleyebilmelidirler.

11. Öğrenciler asetik asidin elde edilme yöntemlerini kullanarak ağırlığı verilen bir maddeden oluşan asetik asidin mol ağırlığını hesaplayabilmelidirler.

12. Öğrenciler verilen yağ asitlerini formülleri ile eşleştirebilmelidirler.

13. Öğrenciler okzalik asidin elde ediliş yöntemlerinden faydalanarak verilen bir tepkime sonucu oluşan okzalik asidi seçebilmelidirler.

14. Öğrenciler okzalik asidin kimyasal özelliklerine dayanarak verilen bir tepkimedeki maddeyi belirleyebilmelidirler.

15. Öğrenciler okzalik asidin asitli $KMnO_4$ ve asitli $K_2Cr_2O_7$'li ortamda yükseltgenme denklemini verilen denklemler arasından seçebilmelidirler.

16. Öğrenciler verilen asitler arasından hem bir değerli hem de iki değerli gibi davranan organik asidi seçebilmelidirler.

17. Öğrenciler üre'nin elde ediliş yöntemlerinden herhangi birini kullanarak istenilen miktarda üre elde etmek için gerekli maddelerin hacimlerini hesaplayabilmelidirler.

18. Öğrenciler verilen asitlerden hangisinin optikçe aktiflik gösterdiğini belirleyebilmelidirler.

19. Öğrenciler herhangi bir asidin kimyasal özellikleri verildiğinde bu özelliğin hangi aside ait olduğunu belirleyebilmelidirler.

20. Öğrenciler herhangi bir asidin metal tuzunda bulunan metal oranı verildiğinde asidin molekül ağırlığını hesaplayabilmelidirler.

21. Öğrenciler herhangi bir asidin metal tuzunda bulunan metal oranı verildiğinde bu asidi verilen diğer asitler arasından seçebilmelidirler.

22. Öğrenciler herhangi bir asidin metal tuzunda bulunan metal oranı verildiğinde bu asitteki karbon sayısını hesaplayabilmelidirler.

23. Öğrenciler herhangi bir asidin molekül ağırlığı verildiğinde, bu asidin kaç karbonlu olduğunu hesaplayabilmelidirler.

24. Öğrenciler herhangi bir asidi nötrleştiren baz moloritesi, ve hacmi ile asid miktarı verildiğinde asidin yüzdesini hesaplayabilmelidirler.

25. Öğrenciler herhangi bir tepkimede maddelerden birinin mol, gr. veya litre cinsinden miktarı verildiğinde, tepkimeye giren ve çıkan maddelerin mol, kütle ve hacimlerini hesaplayabilmelidirler.

26. Öğrenciler herhangi bir tepkimede maddelerden birinin ağırlığı veya hacmi verildiğinde, tepkimeye giren ve çıkan diğer maddelerin mol ağırlığını, kütle ve hacimlerini hesaplayabilmelidirler.

27. Öğrenciler herhangi bir tepkime verildiğinde bu tepkimeye giren ve çıkan maddelerin mol sayılarını hesaplayabilmelidirler.

28. Öğrenciler bir alkol ve asit tepkimesinden oluşan ester denkleminde, alkol ve esterin mol ağırlığı verildiğinde, asidin veya alkolün ağırlığını hesaplayabilmelidirler.

II. ÖĞRENME BİRİMİ: ESTERLER

Öğrenme Hedefleri:

1. Öğrenciler esterlerin yapısında organik asitlerin yanındaki organik bileşiği belirleyebilmelidirler.

2. Öğrenciler verilen organik maddelerin genel formülleri arasından esteri seçebilmelidirler.

3. Öğrenciler bir esteri oluşturan madde çiftini belirleyebilmelidirler.

4. Öğrenciler verilen organik maddeler arasından esteri seçebilmelidirler.

5. Öğrenciler Cenevre sistemine göre adlandırılan bir esterin formülünü verilen madde formülleri arasından seçebilmelidirler.

6. Öğrenciler verilen bir esterin hangi asidin izomerisi olduğunu belirleyebilmelidirler.

7. Öğrenciler verilen bir asidin hangi esterin izomerisi olduğunu belirleyebilmelidirler.

8. Öğrenciler esterlerin sabunlaşmasından elde edilen organik bileşiği belirleyebilmelidirler.

9. Öğrenciler inorganik asitlerin esterlerini verilen organik madde formülleri arasından seçebilmelidirler.

10. Öğrenciler esterlerin genel elde yöntemlerini kullanarak hangi esterin oluşacağını verilen organik madde formülleri arasından seçebilmelidirler.

11. Öğrenciler verilen esterler arasından özel bir esteri seçebilmelidirler.

12. Öğrenciler yağları genel yapılarına göre isimlendirebilmelidirler.

13. Öğrenciler doymuş ve doymamış (sıvı) yağ formüllerini verilen yağ formülleri arasından seçebilmelidirler.

14. Öğrenciler sabunlaşma olayında hangi organik madde çiftinin oluştuğunu belirleyebilmelidirler.

15. Öğrenciler mumları genel yapılarına göre isimlendirebilmelidirler.

16. Öğrenciler verilen organik maddeler arasından sabun formülünü belirleyebilmelidirler.

17. Öğrenciler molekul ağırlığı verilen bir esterin formülünü bulabilmelidirler.

18. Öğrenciler molekül ağırlığı verilen bir esteri oluşturan asit veya alkolün molekül ağırlığını hesaplayabilmelidirler.

19. Öğrenciler gramı veya molü verilen, bir yağı oluşturan yağ asidinin ağırlığını hesaplayabilmelidirler.

20. Öğrenciler hacmi veya ağırlığı verilen bir esterin molar derişimini hesaplayabilmelidirler.

21. Öğrenciler ağırlığı verilen bir esteri oluşturan alkolün veya asidin yüzde ağırlığını hesaplayabilmelidirler.

22. Öğrenciler çözelti olarak verilen alkol, asit veya esterin yüzdesini hesaplayabilmelidirler.

III. ÖĞRENME BİRİMİ: ALİFATİK AMONYAK TÜREVLERİ

Öğrenme Hedefleri:

1. Öğrenciler verilen organik bileşikler içinden baz özelliği gösteren organik maddeyi seçebilmelidirler.

2. Öğrenciler verilen organik bileşikler arasından aminin genel formülünü belirleyebilmelidirler.

3. Öğrenciler verilen organik bileşikler içinden amini seçebilmelidirler.

4. Öğrenciler ismi verilen bir aminin formülünü bulabilmelidirler.

5. Öğrenciler aminlerin genel elde yöntemlerini kullanarak verilen bir tepkime sonucu ortaya çıkan amini belirleyebilmelidirler.

6. Öğrenciler aminlerin inorganik asitlerle verdiği organik maddeyi belirleyebilmelidirler.

7. Öğrenciler verilen organik bileşikler arasından amidi belirleyebilmelidirler.

8. Öğrenciler verilen bir amidin formülünü Cenevre Sistemine göre isimlendirebilmelidirler.

9. Öğrenciler verilen bir amidin hangi madde çiftinden elde edildiğini belirleyebilmelidirler.

10. Öğrenciler verilen amidler arasından hangisinin nötr ya da sıvı özellik gösterdiğini belirleyebilmelidirler.

11. Öğrenciler amidlerin sulu asidlerle hangi organik bileşigi verdiğini belirleyebilmelidirler.

12. Öğrenciler amino asitlerin hangi özel grubu taşıdığını belirleyebilmelidirler.

13. Öğrenciler formülü verilen bir amino asidi Cenevre Sistemine göre adlandırabilmelidirler.

14. Öğrenciler amino asitlerin genel elde yöntemlerini kullanarak ortaya çıkan organik maddeyi belirleyebilmelidirler.

15. Öğrenciler verilen organik bileşiklerden hangisinin anfoter özellik gösterdiğini belirleyebilmelidirler.

16. Öğrenciler verilen asitler arasından hangisinin iç tuz oluşturduğunu belirleyebilmelidirler.

17. Öğrenciler proteinlerin yapısında bulunan organik bileşiği tanıyabilmelidirler.

18. Öğrenciler ağırlığı verilen bir aminin formülünü bulabilmelidirler.

19. Öğrenciler derişimi verilen bir amino asidin formülünü bulabilmelidirler.

20. Öğrenciler ağırlığı verilen bir amidin formülünü bulabilmelidirler.

IV. ÖĞRENME BİRİMİ: AROMATİK BİLEŞİKLER

Öğrenme Hedefleri:

1. Öğrenciler benzenin hangi alifatik veya anorganik bileşikten elde edildiğini belirleyebilmelidirler.
2. Öğrenciler aromatik asidlerin sodyum hidroksit ile hangi aromatik bileşiği verdiğini belirleyebilmelidirler.
3. Öğrenciler benzenin kimyasal olarak hangi alifatik bileşiklere benzediğini belirleyebilmelidirler.
4. Öğrenciler benzenin halojen ile hangi bileşiği verdiğini belirleyebilmelidirler.
5. Öğrenciler benzenin halojenlerle tepkimesini verilen tepkimeler arasından seçebilmelidirler.
6. Öğrenciler benzenin hidrojen ile tepkimesinden oluşan bileşiği belirleyebilmelidirler.
7. Öğrenciler benzenin nitrik asid (HNO_3) ile tepkimesinden oluşan bileşiği belirleyebilmelidirler.
8. Öğrenciler benzenin sulfolandırılmasından oluşan bileşiği belirleyebilmelidirler.
9. Öğrenciler verilen aromatik bileşik formülleri arasından aromatik bileşiğinin izomerini seçebilmelidirler.

10. Öğrenciler verilen organik maddeler arasından tolüeni seçebilmelidirler.

11. Öğrenciler verilen kimyasal tepkimeler arasından tolüenin elde edilme yöntemini belirleyebilmelidirler.

12. Öğrenciler verilen organik madde formülleri arasından ksilenin izomerini seçebilmelidirler.

13. Öğrenciler verilen organik bileşik formülleri arasından naftalin bileşiğini seçebilmelidirler.

14. Öğrenciler verilen organik maddeler arasından antraseni belirleyebilmelidirler.

15. Öğrenciler verilen bir aromatik karışımdaki maddelerin yüzde miktarlarını hesaplayabilmelidirler.

16. Öğrenciler ağırlığı verilen bir aromatik bileşiğin normal koşulda kaç litre halojen ile tepkimeye girdiğini hesaplayabilmelidirler.

17. Öğrenciler aromatik nitro bileşiklerinin hidrojenlendirilmesi ile elde edilen bileşiği belirleyebilmelidirler.

18. Öğrenciler verilen aromatik bileşikler arasından hangisinin asid veya baz özelliğini gösterdiğini belirleyebilmelidirler.

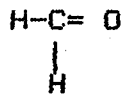
19. Öğrenciler molaritesi verilen aromatik bileşiğin hacmini hesaplayabilmelidirler.

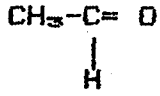
20. Öğrenciler hacmi verilen bir aromatik bileşiğin molar derişimini hesaplayabilmelidirler.

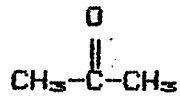
I. ÖĞRENME BİRİMİ: ORGANİK ASİTLER

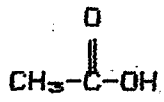
İZLEME TESTİ I A

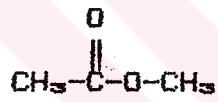
1. Aşağıdakilerden hangisi bir organik asit formülüdür?

a) 

b) 

c) 

(d) 

e) 

2. Aşağıdaki asitlerden hangisi bir organik asittir?

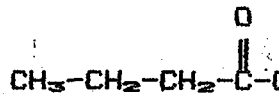
a) $HClO_3$

b) $H\ Br\ O_3$

(c) $HC_2\ H_3\ O_2$

d) H_2SO_4

e) H_3PO_4

3.  formülü ile gösterien maddenin adı nedir?

a) Palmitik asit

(b) Bütirik asit

c) Propionik asit

d) Valerik asit

e) Stearik asit

4. Aşağıdakilerden hangisi bir değerli bir asittir?

(a) C_4H_9-COOH

b) C_2H_4(COOH)(COOH)

c) COOH
|
COOH

d) C_2H_3(COOH)(COOH)(COOH)

e) C_3H_6(COOH)(COOH)

5. Bir değerli bir asidin PCl_5 ile tepkimesi sonucu hangi madde oluşur?

(a) Asit halojenür

b) Asit anhidrit

c) Su ve tuz

d) Alkolat

e) Tuz

6. n-propil alkol'ün 2° yükseltgenmesi ile aşağıdakilerden hangisi elde edilir?

(a) n-propanoik asit

b) Pentanoik asit

c) Butanon

d) Pentanon

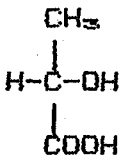
e) Etanoik asit

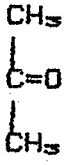
7. Aşağıdaki bileşiklerden hangisinin 2 molü Zn metali ile tepkimeye girdiğinde 1 mol H_2 açığa çıkarır?

(a) HCOOH

b) $(COOH)_2$

c) CH_3CHO

d)


e)


8. 2 mol formik asitten 1 mol su çıkarılırsa aşağıdaki hangi madde oluşur?

a) Asetik asit

b) Di metil eter

(c) Formik anhidrid

d) Metil asetat

e) Formik asit metil esteri

9. Metanol iki derece yükseltgenirse hangi madde oluşur?

a) Metil alkol

b) Oksi metan

c) Asetik asit

d) Di metil metan

(e) Formik asit

10. 2 molekül asetik asitten 1 molekül su çıkartılırsa hangi madde meydana gelir?

a) Metil asetat

b) Di metil eter

c) Etilen

(d) Asetik asit anhidridi

e) Aset aldehit

11. 10,9 gr etil bromürden önce alkol, sonra aldehit, sonra da asit elde edilirse oluşan asidin mol ağırlığı kaçtır?

a) 4,6

(b) 6

c) 7,4

d) 9

e) 6,5

12. Aşağıda verilen yağ asitlerini formülleri ile eşleştiriniz.

a) Butirik asit (b)	a) $C_{17}H_{33}COOH$
b) Palmitik asit (e)	b) C_3H_7COOH
c) Stearik asit (d)	c) $C_{17}H_{31}COOH$
d) Oleik asit (a)	d) $C_{17}H_{35}COOH$
e) Linoleik asit (c)	e) $C_{15}H_{31}COOH$

13. Sodyum okzalat'in H_2SO_4 ile tepkimesinden aşağıdaki maddelerden hangisi oluşur?

a) Linoleik asit

$C_{17}H_{31}COOH$

b) Malonik asit

$COOH-CH_2-COOH$

(c) Okzalik asit

d) Oleik asit

$C_{17}H_{33}COOH$

e) Linolenik asit

$C_{17}H_{29}COOH$

14. Aşağıdakilerden hangisinin bir molü Mg metali ile tepkimeye girdiğinde 1 mol H_2 verir?

a) Asetik asit

b) Süt asidi

c) Formik asit

d) Etandiol

(e) Okzalik asit

15. Aşağıdakilerden hangisi okzalik asidin asitli $KMnO_4$ ile tepkimesinin denklemidir?

(a) $5C_2H_2O_4+2KMnO_4+3H_2SO_4 \longrightarrow 10CO_2+K_2SO_4+2MnSO_4+8H_2O$

b) $5C_2H_2O_4+2KMnO_4+3H_2SO_4 \longrightarrow 5CO_2+K_2SO_4+MnSO_4+H_2O$

c) $C_2H_2O_4+KMnO_4+H_2SO_4 \longrightarrow CO_2+K_2SO_4+MuSO_4+H_2O$

d) $5C_2H_2O_4+2KMnO_4+3H_2SO_4 \longrightarrow 10CO_2+2MnSO_4+8H_2O$

e) $5C_2H_2O_4+2KMnO_4+3H_2SO_4 \longrightarrow 10CH_3OH+2MNSO_4+8H_2O$

16. Aşağıdakilerden hangisi hem bir değerde hem iki değerli bir asit gibi davranır?

a) Asetik asit

b) Laktik asit

c) Stearik asit

(d) Karbonik asit

e) Formik asit

17. 300 gr. üre edebilmek için kullanılan CO_2 ve NH_3 gazlarının normal koşullardaki hacmi nedir? (C=12, N=14, O=16, H=1)

a) 112 / CO_2 , 178,4 / NH_3

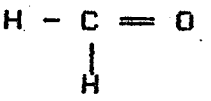
b) 178,4 / CO_2 , 89,6 / NH_3

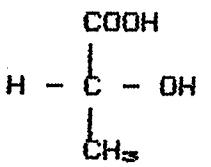
c) 89,6 / CO_2 , 178,4 / NH_3

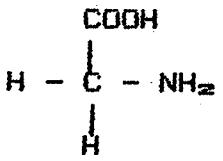
d) 224 / CO_2 , 112 / NH_3

(e) 112 / CO_2 , 224 / NH_3

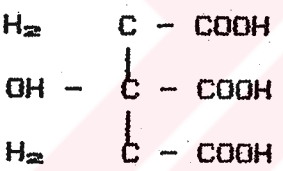
18. Aşağıdakilerden hangisi optikçe aktiflik gösterir?

a) 

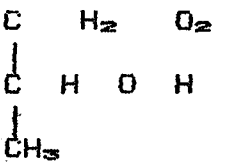
(b) 

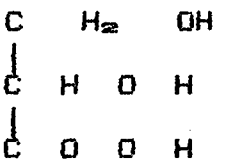
c) 

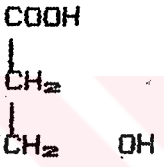
d) 

e) 

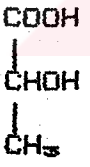
19. Bir organik maddenin 1 molu NaOH ile tepkime veriyor. Na metali ile 1 mol H_2 çıkarıyor, ve optikçe aktiflik gösteriyor. Buna göre bu bileşik aşağıdakilerden hangisi olabilir?

a) 

b) 

c) 

d) 

(e) 

20. Bir dikarboksilli asidin kalsiyum tuzunun 12,8 gramında 4 gr. Ca vardır. Bu asidin molekül ağırlığı nedir? (Ca=40, C=12, O=16)

a) 48

b) 88

c) 89

(d) 90

e) 128

21. Bir mono karboksilli asidin Mg tuzunun 22,6 gramında 2,4 Mg bulunmuştur. Bu asit aşağıdakilerden hangisidir?

(a) $C_4H_9 - COOH$

b) $CH_3 - COOH$

c) $H - COOH$

d) $C_2H_5 - COOH$

e) $C_3H_7 - COOH$

22. Bir mono karboksilli asidin Sodyum tuzunun 16,4 gramında 4,6 gram sodyum bulunduğuna göre bu asitte kaç tane C vardır? (Na=23, C=12)

a) 1

(b) 2

c) 3

d) 4

e) 5

23. Doymuş bir hidrokarbondan türeyen ve sadece asit fonksiyonu gösteren dikkarboksilli bir asidin molekül ağırlığı 132 olduğuna göre, molekülü kaç karbonludur?

a) 3

b) 4

(c) 5

d) 6

e) 7

24. 10 gre. sirke çözeltisini nötrleştirmek için 40 $cm.^3$ 0,15 M NaOH çözeltisi kullanıldığına göre, sirkenin içinde ağırlıkça yüzde kaç asit vardır?
($CH_3 COOH$ = 60, NaOH = 40)

a) 3
(b) 3,6
c) 6
d) 36
e) 60

25. 23 gr. formik asidin H_2SO_4'lu ortamda ayrışmasından normal koşullar altında kaç litre CO elde edilir? (HCOOH = 46)

a) 44,8

b) 22,4

(c) 11,2

d) 5,6

e) 2,24

26. 2 mol asitden mol ağırlığı 102 gr. olan Anhidrid oluşuyor. Kullanılan asitin mol ağırlığı kaçtır?

(a) 60

b) 23

c) 46

d) 74

e) 64

27. Eşit mol sayıda etilen ve propin içeren bir karışım 12 mol hidrojenle tamamen tepkimeye giriyor. Karışımdaki gazlar kaçar moldür?

a) 1

b) 2

c) 3

(d) 4

e) 5

28. 1 mol propil alkolle 1 mol organik asit tepkimeye girdiğinde mol ağırlığı 102 gr. olan bir ester oluşuyor. Kullanılan asidin mol ağırlığı kaç gramdır?

(a) 60

b) 30

c) 74

d) 92

e) 46

II. ÖĞRENME BİRİMİ: ESTERLER

İZLEME TESTİ II A

1. Organik asitler aşağıdaki hangi madde ile ester oluşturur?

   a) Aldehit

   b) Keton

   c) Alkan

   (d) Alkol

   e) Alken

2. Aşağıdakilerden hangisi esterin genel formülüdür?

   a) C_nH_{2n}

   (b) $C_nH_{2n}O_2$

   c) $C_nH_{2n+2}O$

   d) C_nH_{2n+2}

   e) $C_nH_{2n}O$

3. $C_3H_7-\underset{\displaystyle O-CH_3}{\overset{\displaystyle O}{\overset{\|}{\underset{|}{C}}}}$ esteri hangi madde çiftinden elde edilir?

   a) $CH_3-COOH+C_3H_7OH$

   b) $C_3H_7-OH+C_2H_5-COOH$

   (c) $C_3H_7-\underset{\displaystyle OH}{\overset{\displaystyle O}{\overset{\|}{\underset{|}{C}}}}-O+CH_3OH$

   d) $C_2H_5COOH+C_2H_5OH$

   e) $CH_3-OH+C_3H_7-OH$

4. Aşağıdaki organik maddelerden hangisi esterdir?

a) C_3H_7CHO

b) $CH_3-CO-CH_3$

c) C_3H_7OH

(d) $CH_3-C(=O)-O-C_2H_5$

e) $C_5H_{11}COOH$

5. Cenevre sistemine göre adlandırılan, bütanoik asidin etil esteri'nin formülü aşağıdakilerden hangisidir?

a) $C_2H_5COO-C_3H_7$

(b) $C_3H_7-COO-C_2H_5$

c) $C_3H_7COO=CH_3$

d) $C_4H_9-COO-C_2H_5$

e) $C_4H_9-COO-CH_3$

6. $CH_3-C(=O)-O-CH_3$ hangi asidin izomeridir?

a) Asetik asit

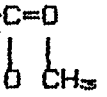
b) Formik asit

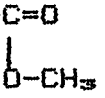
(c) Propiyonik asit

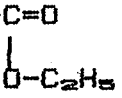
d) Bütirik asit

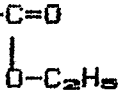
e) Oksi formik asit

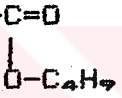
7. Asetik asitin izomeri olan ester aşağıdakilerden hangisidir?

a) 

(b) 

c) 

d) 

e) 

8. Esterlerin su ile tepkimesine ne ad verilir?

a) Hidroliz

(b) Sabunlaşma

c) Nötürleşme

d) Yanma

e) Açillenme

9. Aşağıdakilerden hangisi inorganik asidin esteridir?

(a) $C_2H_5-HSO_4$

b) C_2H_5-ONa

c) $CH_3-CO-C_2H_5$

d) C_4H_7-OH

e) $C_2H_4(OH)_2$

10. $CH_3-\underset{\underset{Cl}{|}}{C}=O + C_2H_5OH$ çifti hangi esteri verir?

a) $C_2H_5-\underset{\underset{O}{|}}{C}=O$

b) $C_2H_5-COO-CH_3$

(c) $CH_3-\underset{\underset{O-C_2H_5}{|}}{C}=O$

d) $CH_3-CO-C_2H_5$

e) $C_2H_5-O-CH_3$

11. Aşağıdakilerden hangisi elma esteridir?

(a) $CH_3-\underset{\underset{O-C_2H_5}{|}}{C}=O$

b) $CH_3-\underset{\underset{O-CH_3}{|}}{C}=O$

c) $H-\underset{\underset{O-CH_3}{|}}{C}=O$

d) $C_2H_5-\underset{\underset{O-C_2H_5}{|}}{C}=O$

e) $C_3H_7-\underset{\underset{O-CH_3}{|}}{C}=O$

12. Yağların yapısınedir?

a) Alkol

b) Asit

(c) Ester

d) Alkolat

e) Aldehit

13. Aşağıdakilerden hangisi sıvı yağı gösterir?

a) $C_3H_5(COOC_{17}H_{35})_3$

b) $C_3H_5(COOC_9H_{19})_3$

c) $C_3H_5(COOC_{15}H_{31})_3$

(d) $C_3H_5(COOC_{17}H_{31})_3$

e) $C_3H_5(COOC_{15}H_{33})_3$

14. $C_3H_5(COOC_{17}H_{35})_3$ katı yağı sabunlaşırsa hangi madde çifti oluşur?

a) $C_{17}H_{35}COOH+C_3H_5OH$

b) $C_{17}H_{35}OH+C_3H_5COOH$

(c) $C_{17}H_{35}COOH+C_3H_5(OH)_3$

d) $C_{17}H_{35}OH+C_3H_5OH$

e) $C_{17}H_{35}COOH+CH_3OH$

15. Mumların yapısı nedir?

a) Aldehit

b) Keton

c) Asit

(d) Ester

e) Eter

16. Aşağıdakilerden hangisi beyaz sabunun formülüdür?

(a) $C_{17}H_{35}COONa$

b) C_3H_7COOK

c) $(C_{15}H_{31}COO)_2Mg$

d) $C_{17}H_{31}COOK$

e) $C_{17}H_{33}COONa$

17. C atom-gr sayıları eşit olan asit ve alkolden oluşan esterin molekül ağırlığı 172 gramdır. Formülü nedir?

a) $C_2H_5-C(=O)-O-C_3H_7$

b) $C_3H_7-C(=O)-O-C_4H_9$

(c) $C_4H_9-C(=O)-O-C_5H_{11}$

d) $CH_3-C(=O)-O-C_2H_5$

e) $H-C(=O)-O-CH_3$

18. Molekül ağırlığı 60 olan organik asit ile alkolün oluşturduğu esterin ağırlığı 74 $gr/_{mol}$ olduğuna göre alkolün mol ağırlığı nedir?

a) 64

b) 28

c) 18

(d) 32

e) 102

19. 0,3 molü 103,2 gr olan yağı oluşturan, yağ asidinin mol ağırlığı nedir?

a) 99

b) 100

c) 101

(d) 102

e) 103

20. 200 cm^3 CH_3COOH çözeltisi, C_2H_5OH ile 4,4 gr ester oluşturuyor. Asidin derişimi nedir?

a) 0,5

(b) 0,25

c) 1

d) 0,1

e) 0,75

21. 44 gr asetikasit etil esteri elde etmek için % 80'lik kaç gr etil alkol gerekir?

a) 23 gr

b) 25,25

(c) 28,75

d) 24,25

e) 25

22. 23 gr'lık etil alkolün tamami asetik asitle tepkimeye girerek 35,2 gr ester oluşturuyor. Çözeltideki alkol yüzdesi nedir?

a) % 40

b) % 20

c) % 10

(d) % 80

e) % 50

III. ÖĞRENME BİRİMİ: ALİFATİK AMONYAK TÜREVLERİ

İZLEME TESTİ III A

1. Aşağıdaki organik bileşiklerden hangisi baz özelliği gösterir?

   a) C_2H_5OH

   b) $C_5H_{11}CHO$

   (c) CH_3NH_2

   d) CH_3COOH

   e) CH_3COCH_3

2. Aşağıdakilerden hangisi aminlerin genel formülüdür?

   a) R-CHO

   b) R-CO-R

   c) R-CO-NH_2

   (d) R-NH_2

   e) R-OH

3. Aşağıdakilerden hangisi segonder (ikincil) amindir?

   a) CH_3-NH_2

   (b) CH_3-NH-CH_3

   c) $(CH_3)_3N$

   d) CH_3-CO-NH_2

   e) NH_3

4. Metil, etil aminin formülü aşağıdakilerden hangisidir?

   (a) CH_3-NH-C_2H_5

   b) $(CH_3)_2NH$

   c) $(C_2H_5)_2N$-CH_3

   d) $(C_2H_5)_2NH$

   e) $(C_2H_5)_3N$

5. [$C_2H_5-NH_2+CH_3-Cl$] tepkimesi aşağıdakilerden hangi organik bileşiği oluşturur?

a) $(C_2H_5)Cl$

(b) $C_2H_5-NH-CH_3$

c) CH_3-Cl

d) CH_3NH_2

e) $(C_3H_7)NH_2$

6. $C_2H_5-NH_2+HCl$ ——→tepkimesi hangi organik bileşiği verir?

a) C_2H_5Cl

b) $(C_2H_5)_2NH$

(c) $[C_2H_5-NH_3]Cl$

d) C_2H_5NH

e) NH_4Cl

7. Açillendirilmiş amonyak aşağıdakilerden hangisidir?

a) Amin

b) Asit

c) Amino asit

(d) Amid

e) Alkil amonyum tuzu

8. $C_2H_5-\underset{\displaystyle NH_2}{\overset{\displaystyle |}{C}}=O$ bileşiğinin adı aşağıdakilerden hangisidir?

a) Formamid

b) Asetamid

(c) Propiyonamid

d) Metil amin

e) Dietil amin

9. Asetamid aşağıdaki hangi madde çiftinden elde edilir?

(a) $CH_3CO-Cl+NH_3$

b) $C_2H_5COOH + NH_3$

c) $NH_3 + CH_3-Cl$

d) $H - COOH+NH_3$

e) $H - CO - Cl + NH_3$

10. Aşağıdaki amidlerden hangisi sıvıdır?

a) $CH_3-\underset{\underset{NH_2}{|}}{C}=O$

b) $C_2H_5-\underset{\underset{NH_2}{|}}{C}=O$

c) $C_3H_7-\underset{\underset{NH_2}{|}}{C}=O$

(d) $H-\underset{\underset{NH_2}{|}}{C}=O$

e) $(C_2H_5)NH_2$

11. Amidlerin sulandırılmış HCl ile tepkimesi hangi organik bileşiği verir?

a) Aldehit

b) Keton

(c) Asit

d) Eter

e) Ester

12. Karbon iskeletinde NH_2 grubu taşıyan organik bileşiğe ne ad verilir?

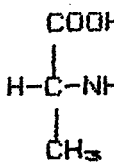
a) Amin

b) Amid

c) Amonyum türevi

d) Ester

(e) Amino asit

13.  bileşiğinin cenevre sistemine göre adı nedir?

a) β amino propiyonik asit

b) α amino butanoik asit

c) 1 amino etanoik asit

(d) α amino propiyonik asit

e) amino asetik asit

14. Proteinlerin hidrolizi ile aşağıdaki hangi organik bileşik elde edilir?

a) Amin

(b) Amino asit

c) Amid

d) Amonyak

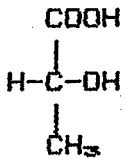
e) Asit

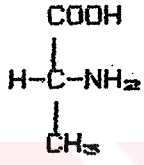
15. Aşağıdaki bileşiklerden hangisi amfoter özellik gösterir?

a) C_2H_5COOH

b) C_3H_7-OH

c) $C_6H_{11}-NH_2$

d)


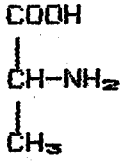
(e)


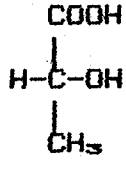
16. Hangi asit iç tuz oluşturur?

a) CH_3COOH

b) H-COOH

c)


(d)


e)


17. Proteinleri oluşturan azotlu bileşik hangisidir?

a) Amin

(b) Amino asit

c) Amonyak

d) Amid

e) Amonyum tuzları

18. 1 mol HCl ile 110 gr alkıl amonyum klorün veren pirimer (birincil) aminin formülü nedir?

a) CH_3NH_2

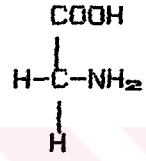
b) $C_2H_5NH_2$

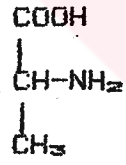
(c) $C_4H_9NH_2$

d) $C_3H_7NH_2$

e) $C_6H_{11}NH_2$

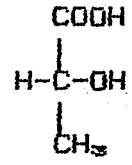
19. 0,2 M, 200 cm^3 HCl çözeltisi, 3 gr amino asidle tepkimeye giriyor. Amino asidin formülü nedir?

(a)


b)


c) $(C_2H_5)_2NH$

d) CH_3-NH

e)


20. 17,4 gr amid elde ediminde oluşan HCl'ü 0,2 mol NaOH nötralleştirdiğine göre amidin formülü nedir?

a) $C_3H_7-NH_2$

(b) $C_3H_7-\underset{\displaystyle NH_2}{\overset{\displaystyle O}{\overset{\|}{C}}}$

c) C_3H_7-OH

d) $CH_3-\underset{\displaystyle NH_2}{\overset{\displaystyle O}{\overset{\|}{C}}}$

e) $H-\underset{\displaystyle NH_2}{\overset{\displaystyle O}{\overset{\|}{C}}}$

IV. ÖĞRENME BİRİMİ: AROMATİK BİLEŞİKLER

İZLEME TESTİ IV A

1. Asetilen hangi metal borudan geçirilerek benzen elde edilir?

   a) Ca

   b) Cu

   c) Ni

   (d) Fe

   e) Zn

2. Sodyum Benzoat, sodyum hidroksit ile hangi aromatik bileşiği verir?

   a) C_6H_5-OH

   b) $C_6H_5-NH_2$

   (c) C_6H_6

   d) $C_6H_4(NH)_2$

   e) $C_6H_4(OH)_2$

3. Benzenin kimyasal özellikleri hangi alifatik bileşikleri andırır?

   a) Alken

   b) Alkin

   (c) Alkan

   d) Alkol

   e) Asit

4. Benzen 1 mol klor ile tepkimeye girer ise hangi bileşik oluşur?

(a) Mono klor benzen

b) Diklor benzen

c) Benzen klorür

d) Tetra klor benzen

e) 1,2 diklor benzen

5. Benzen halojenlerle hangi tip tepkime ile reaksiyona girer?

a) Katılma

b) Polimerizasyon

c) Kondensasyon

(d) Ornatma

e) Sabunlaşma

6. Benzen H_2 ile Ni katalizörlüğünde hangi bileşiği verir?

a) Tri H_2 benzen

(b) Çiklo heqzan

c) Di H_2 benzen

d) Mono hidrojen benzen

e) Tri klor benzen

7. Benzen H_2SO_4 yardımıyla HNO_3 ile tepkime sonucunda hangi bileşiği verir?

a) Mono nitro benzen

b) Di nitro benzen

(c) Tri nitro benzen

d) Tetra nitro benzen

e) Penta nitro benzen

8. Benzen 1 kere sulfolandırılırsa hangi aromatik bileşiği verir?

(a) $C_6H_5(HSO_3)$

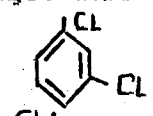
b) $C_6H_5(HSO_3)_2$

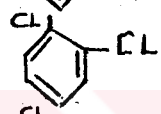
c) $C_6H_5(NO_3)$

d) $C_6H_3(HSO_3)_3$

e) $C_6H_5-SO_4$

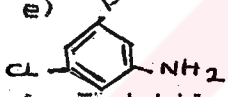
9. Aşağıdakilerden hangisi m-diklor benzendir?

(a) 

b) 

c) 

d) 

e) 

10. Aşağıdakilerden hangisi tolüenin formülüdür?

a) C_6H_5-OH

b) C_6H_5-Cl

c) $C_6H_4-Cl_2$

d) $C_6H_5-NH_2$

(e) $C_6H_5-CH_3$

11. Aşağıdakilerden hangisi tolüenin eldesidir?

(a) $C_6H_5-I+2Na+CH_3-I \longrightarrow NaI+C_6H_5-CH_3$

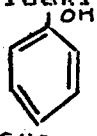
b) $NH_4CNO \longrightarrow NH_2-CO-NH_2$

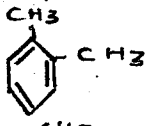
c) $C_5H_{11}-COOH+H_2 \longrightarrow C_5H_{11}-CHO+H_2O$

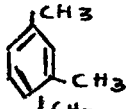
d) $C_6H_6+CL_2 \longrightarrow C_6H_5-Cl+HCl$

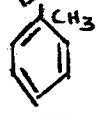
e) $C_2H_5OH+3O_2 \longrightarrow 2CO_2+3H_2O$

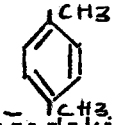
12. Aşağıdakilerden hangisi p-ksilenin formülüdür?

a) 

b) 

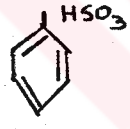
c) 

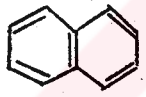
d) 

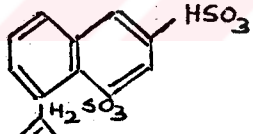
(e) 

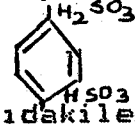
13. Aşağıdakilerden hangisi naftalin sulfon asitinin formülüdür?

a) $C_2H_5-HSO_4$

b) 

c) 

(d) 

e) 

14. Aşağıdakilerden hangisi antrasenin genel formülüdür?

a) C_7H_{14}

b) C_7H_{16}

c) C_7H_{12}

(d) $C_{14}H_{10}$

e) $C_{14}H_{28}$

15. 30 gr benzen çiklo hegzan karışımı % 63 lük, 50 gr HNO_3 ile nitrolanıyor. Ürün dinitro benzen olduğuna göre. karışımdaki benzen %'si nedir?

a) % 60

(b) % 65

c) % 50

d) % 55

e) % 70

16. 15.6 gr. benzeni 1 defa klorlandırmak için N.K. kaç lt Cl_2 gazı gerekir?

a) 5,6

b) 11,2

c) 2,24

d) 44,8

(e) 4,48

17. Nitrobenzenin hidrojenlendirilmesiyle hangi bileşik elde edilir?

a) Toluen

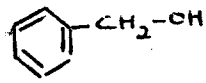
b) Fenol

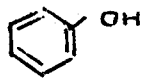
(c) Anilin

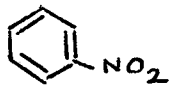
d) Benzen

e) Çiklohegzan

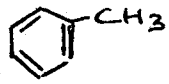
18. Aşağıdaki bileşiklerden hangisi asit özelliği gösterir?

a) 

(b) 

c) 

d) C_2H_5OH

e) 

19. 37,2 gr. anilini nötralleştirmek için 0,5 M. kaç cm^3 HCl çözeltisi gerekir?

a) 1000

b) 2000

c) 750

d) 700

(e) 800

20. 18,8 gr. fenol, 200 cm^3'lük NaOH ile tepkimeye giriyor. NaOH'in molar derişimi nedir?

(a) 1

b) 2

c) 0,5

d) 0,2

e) 0,1

I. ÖĞRENME BİRİMİ: ORGANİK ASİTLER

İZLEME TESTİ I B

1. Aşağıdakilerden hangisi bir organik asit formülüdür?

   a) $C_2H_5-\underset{\underset{H}{|}}{C}=O$

   b) $C_3H_7-\underset{\underset{C_2H_5}{|}}{C}=O$

   c) $CH_3-COO-CH_3$

   (d) $C_4H_9-\underset{\underset{OH}{|}}{C}=O$

   e) C_2H_5-OH

2. Aşağıdaki anitlerden hangisi bir organik asittir?

   a) $HClO_4$

   b) H_3PO_4

   (c) $C_4H_8O_2$

   d) H_2CO_3

   e) H_2S

3. $CH_3-C(CH_3)-CH_2-CH(OH)-CH_2(NH_2)-COOH$ formülünün cenevre sistemine göre adı nedir?

   a) 2 metil. 4 hidroksi, 5 amino heptanoik asit

   (b) 2 amino, 3 hidroksi, 5 metil heqzanoik asit

   c) 1 amino, 2 hidroksi, 4 metil pentanoik asit

   d) 1 amino, 2 hidroksi, 4 metil butanoik asit

   e) 2 metil, 4 hidroksi, 5 amino propanoik asit

4. Aşağıdakilerden hangisi 2 değerli bir asittir?

a) $C_{17}H_{35}COOH$

(b) $COO-(CH_2)_2-COOH$

c) C_2H_3 (COOH, COOH, COOH)

d) C_2H_7-COOH

e) CH_2-OH
$|$
CH_2-OH

5. Bir değerli asidin alkol ile oluşturduğu organik maddenin adı nedir?

a) Su ve tuz

b) alkolat

(c) Ester ve su

d) Asit anhidridi

e) CO_2 ve H_2O

6. Bütil alkolün 1 mol O_2 ile yükseltgenmesinden hangi organik madde elde dilir?

a) Ester

b) Aldehit

c) Keton

(d) Asit

e) CO_2 ve H_2O

7. Aşağıdakilerden hangisi Mg metali ile tepkimeye girdiğinde 1/2 mol H_2 açığa çıkar?

a) Asetaldehit

b) Okzalik asit

c) Aseton

d) Asetikasit

(e) Formik asit

8. Hangi asitten H_2SO_4 katalizörlüğünde 1 mol su çeker isek CO elde edilir?

   a) CH_3-COOH

   b) COOH-COOH

   c) C_4H_9-COOH

   (d) H-COOH

   e) C_2H_5-OH

9. NaOH ve 50 basınç altında hangi organik maddeyi verir?

   (a) H-COOH

   b) C_2H_5-OH

   c) CH_3-CO-CH_3

   d) CH_3-COOH

   e) CH_3-CHO

10. Asetik asit, etil alkol ile hangi organik maddeyi verir?

   a) Metil asetat

   b) Çinko asetat

   c) Aset aldehit

   d) Propanol

   (e) Etil asetat

11. Bir mono karboksilli asitin Mg tuzunun 7,1 gramında 1,2 gr Mg. vardır. Asidin mol ağırlığı nedir?
(Mg=24, C=12, O=16, H=1)

   a) 120

   (b) 60

   c) 80

   d) 180

   e) 30

12. Aşağıdakilerden hangisi Palmitik asittir?

a) $C_{17}H_{35}COOH$

b) $C_{17}H_{33}COOH$

(c) $C_{15}H_{31}COOH$

d) $C_{17}H_{29}COOH$

e) C_3H_7COOH

13. Glikolün O_2 ile yükseltgenmesinden hangi asit elde edilir?

a) Asetik asit

(b) Okzalik asit

c) Formik asit

d) Butirik asit

e) Propanoik asit

14. Okzalik asit ısıtılırsa aşağıdaki maddelerden hangisini verir?

a) $CO + H_2O$

b) $CO_2 + H_2O$

(c) $CO+CO_2+H_2O$

d) $HCOOH+CO$

e) $O_2 + H_2O + CO$

15. Aşağıdakilerden hangisi okzalik asidin $K_2Cr_2O_7$ ile tepkimesini belirler?

a) $3CH_2O_4+4H_2SO_4+K_2Cr_2O_7 \longrightarrow 3CO_2+Cr_2(SO)_3+K_2SO_4+7H_2O$

b) $3C_2H_4O_2+8H_2SO_4+2K_2Cr_2O_7 \rightarrow 6CO_2+2Cr_2(SO_4)_3+2K_2SO_4+14H_2O$

(c) $3C_2O_4H_2+4H_2SO_4+K_2Cr_2O_7 \rightarrow 6CO_2+Cr_2(SO_4)_3+K_2SO_4+7H_2O$

d) $3C_2H_4O+4H_2SO_4+K_2Cr_2O_7 \rightarrow 3C_2H_4O_2+Cr_2(SO_4)_3+K_2SO_4+4H_2O$

e) $3C_2H_6O+2K_2Cr_2O_7+8H_2SO_4 \rightarrow 3C_2H_4O2+2Cr_2(SO_4)_3+2K_2SO_4+11H_2O$

16. Aşağıdaki asitlerden hangisi hem bir değerli hem de iki değerli bir asit gibi davranan formik asittir?

a) CH_3COOH

b) HCOOH

c) COOH COOH

(d) H_2CO_3

e) NH_2 CO NH_2

17. 12 gr. üre elde etmek için 0°C ve 1 atm.. basınçta kaç litre NH_3 gazı kullanılmalıdır?

a) 44,8 lt

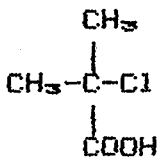
b) 89,6 lt

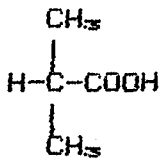
(c) 8,96 lt

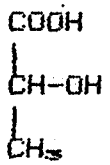
d) 2,24 lt

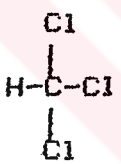
e) 4,48 lt

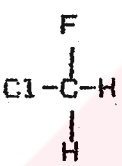
18. Aşağıdakilerden hangisi optikçe aktiflik gösterir?

a)


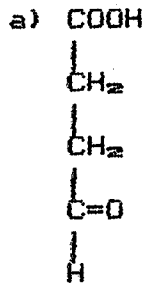
b)


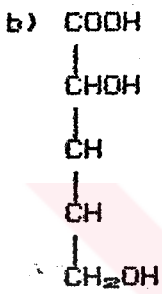
(c)


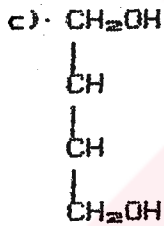
d)


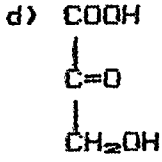
e)


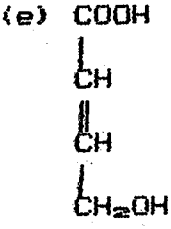
19. Bir organik bileşiğin 1 molü, 1 mol Br_2 ile katılma tepkimesi, Zn metali ile 1 gr. H_2, ve Na metali ile 2 gr. H_2 verdiğine göre bu bileşiğin formülü nedir?

a) 

b) 

c) 

d) 

(e) 

20. Mono karboksilli asidin Na tuzunun 33 gramında 6,9 gr. Na vardır. Bu asidin mol ağırlığı nedir? (Na= 23)

a) 176

(b) 88

c) 44

d) 22

e) 352

21. 14,8 gr. mono asid Na'la 4,48 lt. H_2 veriyor. Asit aşağıdakilerden hangisidir?

(a) C_2H_5COOH

b) CH_3COOH

c) HCOOH

d) C_3H_7COOH

e) C_4H_9COOH

22. Di karboksilli asidin 3,84 gr Ca tuzunda 1,2 gr. Ca vardır. Bu asitte kaç karbon vardır?

a) 3

b) 4

(c) 2

d) 5

e) 1

23. Alkolden türeyen ve asit özelliği gösteren mono karboksilli asidin molekül ağırlığı 102 gr. olduğuna göre bu asidin kaç karbonu vardır?

a) 2

b) 3

c) 4

(d) 5

e) 6

24. 5 gr. HCOOH'i, 0,5 M 200 cm^3 NaOH çözeltisi nötrelleştiriyor. Asit % kaçlıktır?

a) 46
(b) 92
c) 23
d) 90
e) 80

25. Yeterince Zn ile tepkimeye giren 1 M. 10 cm^3 formik asitten N.K. kaç cm^3 gerekir?

(a) 112
b) 56
c) 224
d) 336
e) 448

26. N.K. da 11,2 lt. CO gazından kaç gr. formik asit elde edilir?

a) 46
(b) 23
c) 92
d) 20
e) 60

27. N.K. 10 lt. CO_2 ve NH_3 karışımı sıkıştırılarak üre elde ediliyor, ve 3,28 lt. CO_2 artıyor. Kullanılan CO_2 ve NH_3 gazlarının mol sayıları aşağıdakilerden hangisine eşittir?

a) 2 ve 1
(b) 0,1 ve 02
c) 0,2 ve 0,3
d) 0,4 ve 0,2
e) 3 ve 1

28. Molekül ağırlığı 60 gr. olan organik asitle, alkolün oluşturduğu esterin molekül ağırlığı 74 gr/mol'dür. Alkolün molekül ağırlığı nedir?

a) 44
b) 64
(c) 32
d) 96
e) 22

II. ÖĞRENME BİRİMİ: ESTERLER

İZLEME TESTİ II B

1. Organik asitler ile alkol hangi organik maddeyi oluşturur?

   a) Aldehit

   b) Keton

   (c) Ester

   d) Eter

   e) Asitanhidriti

2. Genel formülü $C_nH_{2n}O_2$ ile gösterilen organik madde aşağıdakilerden hangisidir?

   a) Alkan

   b) Alkol

   (c) Ester

   d) Eter

   e) Keton

3. $C_{15}H_{31}-\underset{\underset{O-CH_3}{|}}{C}=O$ esteri hangi madde çiftinden elde edilir?

(a) $C_{15}H_{31}COOH+CH_3OH$

b) $C_8H_{17}COOH+C_8H_{17}O$

c) CH_3 $COOH+C_{15}H_{31}OH$

d) $C_{15}H_{31}OH+CH_3OH$

e) $C_{14}H_{29}COOH+C_2H_5OH$

4. Aşağıdaki organik maddelerden hangisi esterdir?

a) $C_2H_5-CO-C_2H_5$

b) $C_7H_{15}CHO$

c) $C_{17}H_{35}COOH$

d) $C_8H_{17}OH$

(e) $CH_3 - COO - CH_3$

5. Cenevre sistemine göre adlandırılan; etanoik asidin etil esterinin formülü aşağıdakilerden hangisidir?

a) $C_2H_5-COO-C_2H_5$

b) $CH_3-COO-CH_3$

(c) $CH_3-COO-C_2H_5$

d) $CH_3-COO-C_3H_7$

e) $H-COO-C_2H_5$

6. Etil asetat esterinin izomeri hangi asittir?

a) Propiyonik asit

(b) Bütanoik asit

c) Etanoik asit

d) Pentanoik asit

e) Formik asit

7. Bütanoik asidin izomeri hangi esterdir?

(a) $C_2H_5-C(=O)-O-CH_3$

b) $C_2H_5-C(=O)-O-C_2H_5$

c) $CH_3-C(=O)-O-CH_3$

d) $H-C(=O)-O-CH_3$

e) $C_3H_7-C(=O)-O-CH_3$

8. Metil formiyatın sabunlaşmasından hangi asit elde edilir?

a) Asetik asit

b) Pentanoik asit

c) Propiyonik asit

d) Bütanoik asit

(e) Formik asit

9. Aşağıdakilerden hangisi inorganik asitin esteridir?

a) C_3H_7ONa

b) $CH_3-CO-C_3H_7$

c) $C_2H_4(OH)_2$

(d) $C_3H_5(NO_3)_3$

e) $C_8H_{17}-OH$

10. $C_7H_{15}-COOH+CH_3OH$ madde çifti hangi esteri verir?

a) $CH_3-COO-C_{17}H_{35}$

(b) $C_7H_{15}COO-CH_3$

c) $C_4H_9COO-C_4H_9$

d) $CH_3COO-C_7H_{15}$

e) $C_5H_{11}COO-C_5H_{11}$

11. Aşağıdakilerden hangisi ananas esteridir?

a) $H-COO-CH_3$

b) $CH_3-COO-C_2H_5$

(c) $C_3H_7-COO-C_2H_5$

d) $CH_3-COO-CH_3$

e) $C_3H_7-COO-CH_3$

12. Yağ asitlerinin gliserin ile yaptığı esterlere ne ad verilir?

a) Eter

b) Alkolat

c) Keton

d) Sabun

(e) Yağ

13. Aşağıdakilerden hangisi bir katı yağ formülüdür?

(a) $C_3H_5(COOC_{17}H_{35})_3$

b) $C_3H_5(COOC_{17}H_{33})_3$

c) $C_3H_5(COOC_{17}H_{31})_3$

d) $C_3H_5(COOC_{17}H_{29})_3$

e) $C_3H_5(COOC_{15}H_{29})_3$

14. $C_3H_5(COOC_{15}H_{31})_3$ formülü ile gösterilen yağ sabunlaşırsa hangi madde çifti elde edilir?

a) $C_3H_5OH+C_{15}H_{31}OH$

(b) $C_3H_5(OH)+C_{15}H_{31}COOH$

c) $C_3H_5(OH)_3+C_{15}H_{31}OH$

d) $C_3H_5COOH+C_{15}H_{31}OH$

e) $C_{15}H_{31}COOH+C_3H_5COOH$

15. $C_{15}H_{31}-COO-C_{16}H_{33}$ formülü ile gösterien balina mumunun genel adı nedir?

a) Aldehit

b) Keton

c) Eter

d) Alkol

(e) Ester

16. Aşağıdakilerden hangisi arap sabununun formülüdür?

a) C_3H_7COONa

b) C_4H_9OK

c) $(C_{15}H_{31}COO)_2Mg$

(d) $C_{17}H_{35}COOK$

e) $C_2H_2O_4Ca$

17. Molekül ağırlığı 102 gr/mol olan esteri oluşturan alkoldeki C atom-gr. sayısı asitteki C atom-gr sayısından 1 fazla olduğuna göre esterin formülü nedir?

(a) $CH_3-C(=O)-O-C_3H_7$

b) $H-C(=O)-O-C_2H_5$

c) $C_2H_5-C(=O)-O-C_3H_7$

d) $CH_3-C(=O)-O-C_2H_5$

e) $C_2H_5-C(=O)-O-C_4H_9$

18. Molekül ağırlığı 32 gr/mol olan alkolün organik asitle verdiği esterin molekül ağırlığı 88 gr/mol dür. Asidin molekül ağırlığı nedir?

a) 46

b) 52

c) 60

d) 64

(e) 74

19. 0,5 molü 151 gr. olan yağın sabunlaşmasıyla oluşan yağ asidinin mol ağırlığı nedir?

a) 302

b) 54

(c) 88

d) 92

e) 151

20. 250 cm^3 CH_3COOH çözeltisinin C_2H_5OH ile verdiği ester 2,2 gr. Asid çözeltisinin molar değişimi nedir?

(a) 0,1

b) 0,2

c) 0,5

d) 1

e) 1,5

21. 4,4 gr. propiyonik asid metil esteri elde etmek için % 64'lük kaç gr. CH_3OH gerekir?

a) 4

b) 3

c) 3,5

(d) 2,5

e) 1,5

22. 23,2 gr. ananas esteri elde etmek için 10 gr. etil alkol kullanılıyor. Alkol % kaçlıktır?

a) 96

(b) 92

c) 90

d) 86

e) 82

III. ÖĞRENME BİRİMİ: ALİFATİK AMONYAK TÜREVLERİ

İZLEME TESTİ III B

1. Aşağıdaki bileşiklerden hangisinin sudaki çözeltisi kuvvetli bazik özellik gösterir?

   a) C_2H_5OH

   b) $Fe(OH)_2$

   c) NH_3

   d) $H-C-NH_2$
   $\quad\;\; \|$
   $\quad\;\; O$

   (e) $C_2H_5-NH_2$

2. Aşağıdakilerden hangisi aminlerin genel formülüdür?

   a) $C_nH_{2n}O$

   b) $C_nN_{2n}O_2$

   (c) $C_nH_{2n+1}NH_2$

   d) $C_nH_{2n+2}O$

   e) C_nH_{2n+1}

3. Aşağıdaki bileşiklerden hangisi amindir?

   (a) $C_2H_5-NH_2$

   b) CH_3-CN

   c) $CH-C=O$
   $\quad |$
   $\quad NH_2$

   d) $H_2C-COOH$
   $\quad\;\; |$
   $\quad\;\; NH_2$

   e) $C_2H_5-C=O$
   $\qquad\quad |$
   $\qquad\quad O-NH_4$

4. Di etil aminin formülü aşağıdakilerden hangisidir?

a) $CH_3 \quad NH_2$

b) $C_2H_4(OH)_2$

(c) $[C_2H_5NH_3]\ Cl$

d) $(C_2H_5)_2NH$

e) C_2H_5OH

5. Aşağıdaki reaksiyonlardan hangisinden metil amin elde edilir?

(a) $CH_3I+NH_3 \longrightarrow$

b) $H-COO-NH_4 \longrightarrow$

c) $H-\underset{\displaystyle Cl}{\underset{|}{C}}=O+NH_3 \longrightarrow$

d) $CH_3-COO-CH_3+NH_3 \longrightarrow$

e) $H_2C-\underset{\displaystyle Cl}{\underset{|}{C}}-COOH+NH_3 \longrightarrow$

6. $(C_3H_7)_2-NH+HCl$ tepkimesi hangi organik bileşiği verir?

a) $(C_3H_7)_2Cl$

(b) $[(C_3H_7)_2NH_2]Cl$

c) C_3H_7OH

d) NH_4Cl

e) C_6H_{14}

7. Amid'leri aşağıdaki hangi tanım ile belirleriz?

a) Bir kere alkillenmiş sudur.

b) İki kere alkillenmiş sudur.

c) Alkolün açillendirilmesinden elde edilir.

d) Alkillenmiş amonyaktır.

(e) Açillendirilmiş amonyaktır.

8. $H-C(=O)-NH_2$ bileşiğinin adı cenevre sistemine göre nedir?

a) Asetamid

(b) Formamid

c) Metil amin

d) Di etil amin

e) Propiyonamid

9. Formamid hangi madde çiftinden elde edilir?

a) $CH_3CO-Cl+NH_3$

b) $C_2H_5-CO-Cl+NH_3$

c) CH_3OH+NH_3

(d) $H-CO-Cl+NH_3$

e) $C_2H_5-OH+NH_3$

10. Aşağıdaki bileşiklerden hangisi suda nötr özellik gösterir?

a) Alkol

(b) Amid

c) Asit

d) Eter

e) Ester

11. Amidler sulandırılmış inorganik asiterle hangi organik bileşiği oluşturur?

(a) Asit

b) Aldehit

c) Keton

d) Eter

e) Ester

12. Amino asitler karbon iskeletinde hangi grubu taşır?

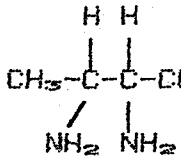
a) OH

b) NO_2

c) -CHO

(d) NH_2

e) -CO

13.  bileşiğinin cenevre sistemine göre adı nedir?

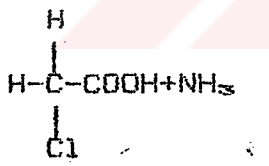
a) 2,2 di amino bütanoik asit

(b) α, ß di amino bütanoik asit

c) ß, ɣ amino propiyonik asit

d) 2 amino etonoik asit

e) Bütonoik asit

14.  tepkimesi hangi organik bileşiği verir?

a) Amino metanoik asit

b) Etil amin

c) Metil amin

(d) Amino asetik asit

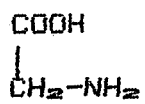
e) Di metil amin

15. Hangi bileşik anfoter özellik gösterir?

a) C_2H_5OH

b) $(CH_3)_2Co$

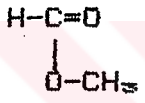
c) HCOOH

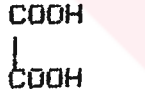
(d) 

e) CH_3-O-CH_3

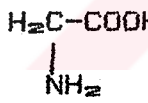
16. Hangi asit iç tuz oluşturur?

a) H-COOH

b) 

c) 

d) CH_3-COOH

(e) 

17. Amino asitler hangi maddenin yapısında bulunur?

a) Ester

b) Alkol

(c) Protein

d) Eter

e) Aldehit

18. 0,2 mol alkolün oluşturduğu amin 9 gr. olduğuna göre, aminin formülü nedir?

a) CH_3-NH_2

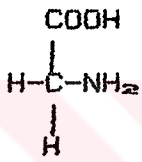
b) $C_3H_7-NH_2$

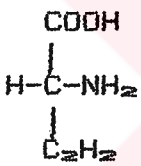
c) $C_5H_{11}-NH_2$

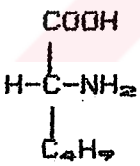
(d) $C_2H_5-NH_2$

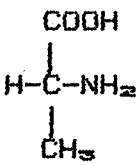
e) $C_4H_9-NH_2$

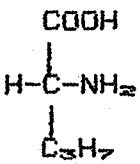
19. 0,2 M. 200 cm^3 HCl çözeltisi, 3,65 gr. amino asitle tepkimeye girdiğine göre asidin bileşim formülü nedir?

a)


b)


c)


(d)


e)


20. 36 gr. amid elde ediminde çıkan HCl'ü 2 M. 400 cm^3 KOH çözeltisi nötralleştiriyor. Amidin formülü nedir?

(a) $H-\underset{\underset{NH_2}{|}}{C}=O$

b) $CH_3-\underset{\underset{NH_2}{|}}{C}=O$

c) $C_2H_5-\underset{\underset{NH_2}{|}}{C}=O$

d) $C_4H_9-\underset{\underset{NH_2}{|}}{C}=O$

e) $C_3H_7-\underset{\underset{NH_2}{|}}{C}=O$

IV. ÖĞRENME BİRİMİ: AROMATİK BİLEŞİKLER

İZLEME TESTİ IV B

1. Benzen hangi alifatik bileşiğin polimerizasyonundan elde edilir?

   a) Etilen

   b) Eter

   (c) Asetilen

   d) Etanol

   e) Aset Aldehit

2. Sodyum benzoatın ısıtılmasından hangi aromatik hidrokarbon elde edilir?

   (a) Benzen

   b) Fenol

   c) Toluen

   d) Antrasen

   e) Naftalin

3. Benzen aşağıdakilerden hangisi ile aynı kimyasal özelliği gösterir?

   a) Asetilen

   b) Etanol

   c) Etilen

   (d) Metan

   e) Asetik asit

4. Benzen 2 mol I_2 ile hangi aromatik bileşiği verir?

   a) C_6H_5I

   (b) $C_6H_4I_2$

   c) $C_6H_3I_3$

   d) $C_6H_2I_4$

   e) C_6HI_5

5. Aşağıdaki tepkimelerden hangisi benzenin ornatma tepkimesidir?

(a) $C_6H_6+I_2 \longrightarrow C_6H_5Cl+HCl$

b) $C_6H_{14}+Cl_2 \longrightarrow C_6H_{13}Cl+HCl$

c) $C_2H_4+Cl_2 \longrightarrow C_2H_4Cl_2$

d) $C_2H_2+I_2 \longrightarrow C_2H_2I_2$

e) $CH_3CHO+H_2 \longrightarrow C_2H_5OH$

6. Çiklohegzan; benzenin hangi element ile tepkimesinden oluşur?

a) Ni

b) Cu

(c) H_2

d) Cl_2

e) I_2

7. Benzen 1 mol NHO_3 ile hangi bileşiği verir?

(a) Mono Nitro benzen

b) Dinitro benzen

c) Tri nitro benzen

d) Toluen

e) Fenol

8. Benzen 1 kere sulfalandırılırsa hangi bileşik elde edilir?

a) Toluen

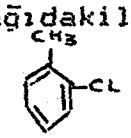
b) Dinitro benzen

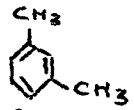
(c) Benzen sulfon asidi

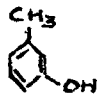
d) Tri nitro toluen

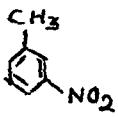
e) Para nitro toluen

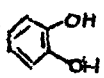
9. Aşağıdakilerden hangisi m-nitro toluendir?

a) 

b) 

c) 

(d) 

e) 

10. $C_6H_5-CH_3$ bileşiğinin adı nedir?

a) Benzen

b) Fenol

c) Naftalin

(d) Toluen

e) Benzoik asit

11. Aşağıdakilerden hangisi toluenin elde edilme tepkimesidir?

a) $3C_2H_2 \longrightarrow C_6H_6$

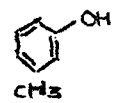
(b) $C_6H_6 + CH_3-Cl \longrightarrow C_6H_5-CH_3 + HCl$

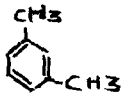
c) $C_6H_{10} + \frac{17}{2} O_2 \longrightarrow 6CO_2 + 5H_2O$

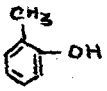
d) $C_6H_6 + 3Cl_2 \longrightarrow C_6H_6Cl_6$

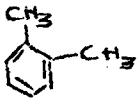
e) $C_6H_6 + HNO_3 \longrightarrow C_6H_5NO_3 + H_2O$

12. Aşağıdakilerden hangisi O-ksilenin formülüdür?

a) 

b) 

c) 

(d) 

e) 

13. Aşağıdakilerden hangisi naftalinin H_2 ile tepkimesinden elde edilir?

(a) Dekalin

b) Anilin

c) Benzil

d) Toluen

e) Fenol

14. $C_{14}H_{10}$ aromatik bileşiğinin adı nedir?

a) Benzen

b) Naftalin

(c) Antrasen

d) Benzil

e) Anilin

15. 20 gr. benzen-çiklohegzan karışımı bir kere sülfolandırmak için 0,2 M, 500 cm^3 H_2SO_4 kullanılıyor. Karışımda benzen %'si kaçtır?

a) % 78

b) % 40

c) % 80

(d) % 39

e) % 50

16. 46,8 gr. benzeni iki kere klorlamak için N.Ş. kaç litre Cl_2 gereklidir?

a) 13,4

(b) 26,88

c) 40,32

d) 8,96

e) 4,48

17. $C_6H_5-NO_2 + 3H_2 \longrightarrow$ tepkimesi hangi aromatik bileşiği verir?

a) C_6H_6

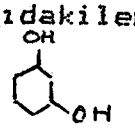
b) $C_6H_4-(NO_2)$

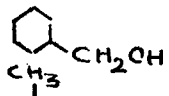
c) $C_6H_5-CH_3$

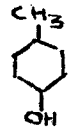
(d) $C_6H_5-NH_2$

e) C_6H_5-OH

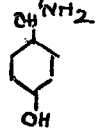
18. Aşağıdakilerden hangisi bazik özellik gösterir?

a) 

b) 

c) 

(d) 

e) 

19. 28,2 gr. fenolü tamamen nitrolamak için 0,8 M. kaç ml. HNO_3 gereklidir?

a) 37

b) 3,7

(c) 375

d) 3750

e) 0,37

20. 200 ml. benzoik asit 4,6 gr. etil alkol ile esterleştiğine göre asidin molar derişimi nedir?

a) 0,05

b) 5

(c) 0,5

d) 0,005

e) 1,5

KİMYA ERİŞİ TESTİ

1. Aşağıdaki asitlerden hangisi bir organik asittir?

   a) $HClO_3$

   b) H Br O_3

   (c) HC_2 H_3 O_2

   d) H_2SO_4

   e) H_3 PO_4

(I Öğrenme Birimi, Öğrenme Hedefi IIA)

2. Bir değerli bir asidin PCl_5 ile tepkimesi sonucu hangi madde oluşur?

   (a) Asit halojenür

   b) Asit anhidrit

   c) Su ve Tuz

   d) Alkolat

   e) Tuz

(I Öğrenme Birimi, Öğrenme Hedefi VA)

3. n-propil alkol'ün 2° yükseltgenmesi ile aşağıdakilerden hangisi elde edilir?

   (a) n-propanoik asit

   b) pentanoik asit

   c) Butanon

   d) pentanon

   e) Etanoik asit

(I Öğrenme Birimi, Öğrenme Hedefi VIA)

4. 2 mol Formik asitten 1 mol su çıkarılırsa aşağıdaki hangi madde oluşur?

a) Asetik asit

b) Di metil eter

(c) Formik anhidrid

d) Metil asetat

e) Formik asit metil esteri

(I Öğrenme Birimi, Öğrenme Hedefi VIIIA)

5. 2 molekül asetik asitten 1 molekül su çıkartılırsa, hangi madde meydana gelir?

a) Metil asetat

b) Di metil eter

c) Etilen

(d) Asetik asit anhidridi

e) Aset aldehit

(I Öğrenme Birimi, Öğrenme Hedefi XA)

6. 300 gr. üre edebilmek için kullanılan CO_2 ve NH_3 gazlarının normal koşullardaki hacmi nedir? (C=12, N=14, O=16, H=1)

a) 112/CO_2 , 178,4/NH_3

b) 178,4/CO_2 , 89,6/NH_3

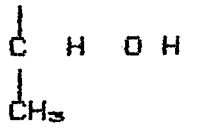
c) 89,6/CO_2 , 178,4/NH_3

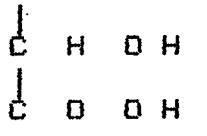
d) 224/CO_2 , 112/NH_3

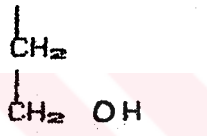
(e) 112/CO_2 , 224/NH_3

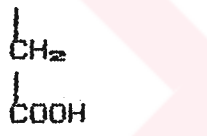
(I Öğrenme Birimi, Öğrenme Hedefi XVIIA)

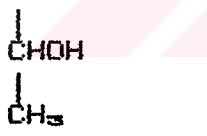
7. Bir organik maddenin 1 molu NaOH ile tepkime veriyor. Na metali ile 1 mol H_2 çıkarıyor, ve optikçe aktiflik gösteriyor. Buna göre bu bileşik aşağıdakilerden hangisi olabilir?

a)


b)


c)


d)


(e)


(I Öğrenme Birimi, Öğrenme Hedefi XIXA)

8. Bir mono karboksilli asidin Mg tuzunun 22,6 gramında 2,4 Mg bulunmuştur. Bu asit aşağıdakilerden hangisidir?

(a) C_4H_9-COOH

b) CH_3-COOH

c) $H-COOH$

d) C_2H_5-COOH

e) C_3H_7-COOH

(I Öğrenme Birimi, Öğrenme Hedefi XXIA)

9. Doymuş bir hidrokarbondan türeyen ve sadece asit fonksiyonu gösteren dikkarboksilli bir asidin molekül ağırlığı 132 olduğuna göre, molekülü kaç karbonludur?

a) 3

b) 4

(c) 5

d) 6

e) 7

(I Öğrenme Birimi, Öğrenme Hedefi XXIIA)

10. 2 mol asitden mol ağırlığı 102 gr. olan Anhidrid oluşuyor. Kullanılan asitin mol ağirliği kaçtır?

(a) 60

b) 23

c) 46

d) 74

e) 64

(I Öğrenme Birimi, Öğrenme Hedefi XXVIA)

11. 1 mol propil alkolle 1 mol organik asit tepkimeye girdiğinde mol ağırlığı 102 gr. olan bir ester oluşuyor. Kullanılan asidin mol ağırlığı kaç gramdır?

(a) 60

b) 30

c) 74

d) 92

e) 46

(I Öğrenme Birimi, Öğrenme Hedefi XXVIIIA)

12. $CH_3-C(CH_3)-CH_2-CH(OH)-CH_2(NH_2)-COOH$ formülünün cenevre sistemine göre adı nedir?

a) 2 metil, 4 hidroksi, 5 amino heptanoik asit

(b) 2 amino, 3 hidroksi, 5 metil hegzanoik asit

c) 1 amino, 2 hidroksi, 4 metil pentanoik asit

d) 1 amino, 2 hidroksi, 4 metil butanoik asit

e) 2 metil, 4 hidroksi, 5 amino propanoik asit

(I Öğrenme Birimi, Öğrenme Hedefi IIIB)

13. Aşağıdakilerden hangisi 2 değerli bir asittir?

a) $C_{17}H_{35}COOH$

(b) $COOH-(CH_2)_2-COOH$

c) C_2H_3 (COOH, COOH, COOH)

d) C_4H_9-COOH

e) CH_2-OH / CH_2-OH

(I Ögrenme Birimi, Ögrenme Hedefi IVB)

14. Bütil alkolün 1 mol O_2 ile yükseltgenmesinden hangi organik madde elde edilir?

a) Ester

b) Aldehit

c) Keton

(d) Asit

e) CO_2 ve H_2O

(I Öğrenme Birimi, Öğrenme Hedefi VIB)

15. Asetik asit, etil alkol ile hangi organik maddeyi verir?

a) Metil asetat

b) Çinko asetat

c) Aset aldehit

d) Propanol

(e) Etil asetat

(I Öğrenme Birimi, Öğrenme Hedefi XB)

16. Aşağıdakilerden hangisi Palmitik asittir?

a) $C_{17}H_{35}COOH$

b) $C_{17}H_{33}COOH$

(c) $C_{15}H_{31}COOH$

d) $C_{17}H_{29}COOH$

e) C_3H_7COOH

(I Öğrenme Birimi, Öğrenme Hedefi XIIB)

17. Okzalik asit ısıtılırsa aşağıdaki maddelerden hangisini verir?

a) $CO + H_2O$

b) CO_2+H_2O

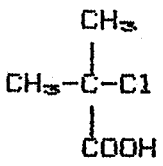
(c) $CO+CO_2+H_2O$

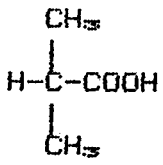
d) $HCOOH+CO$

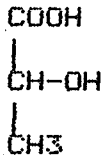
e) $O_2 + H_2O + CO$

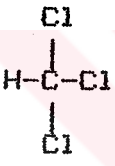
(I Öğrenme Birimi, Öğrenme Hedefi XIVB)

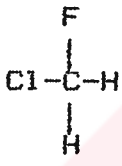
18. Aşağıdakilerden hangisi optikçe aktiflik gösterir?

a) 

b) 

(c) 

d) 

e) 

(I Öğrenme Birimi, Öğrenme Hedefi XVIIIB)

19. Mono karboksilli asidin Na tuzunun 33 gramında 6,9 gr. Na vardır. Bu asidin mol ağırlığı nedir? (Na - 23)

a) 176

(b) 88

c) 44

d) 22

e) 352

(I Öğrenme Birimi, Öğrenme Hedefi XXB)

20. Alkolden türeyen ve asit özelliği gösteren mono karboksilli asidin molekül ağırlığı 102 gr. olduğuna göre bu asidin kaç karbonu vardır?

a) 2

b) 3

c) 4

(d) 5

e) 6

(I Öğrenme Birimi, Öğrenme Hedefi XXIIIB)

21. Yeterince Zn ile tepkimeye giren 1 M. 10 cm^3 formik asitten N.K. kaç cm^3 gerekir?

(a) 112

b) 56

c) 224

d) 336

e) 448

(I Öğrenme Birimi, Öğrenme Hedefi XXVB)

22. Molekül ağırlığı 60 gr. olan organik asitle, alkolün oluşturduğu esterin molekül ağırlığı 74 $gr/_{mol}$ dür. Alkolün molekül ağırlığı nedir?

a) 44

b) 64

(c) 32

d) 96

e) 22

(I Öğrenme Birimi, Öğrenme Hedefi XXVIIIB)

23. Organik asitler aşağıdaki hangi madde ile ester oluşturur?

a) Aldehit

b) Keton

c) Alkan

(d) Alkol

e) Alken

(II Öğrenme Birimi, Öğrenme Hedefi IA)

24. Aşağıdaki organik maddelerden hangisi esterdir?

a) C_3H_7CHO

b) $CH_3-CO-CH_3$

c) C_3H_7OH

(d) $CH_3-\underset{\displaystyle O-C_2H_5}{\overset{\displaystyle O}{\overset{\displaystyle \|}{C}}}$

e) $C_5H_{11}COOH$

(II Öğrenme Birimi, Öğrenme Hedefi IVA)

25. $CH_3-\underset{\displaystyle O-CH_3}{\overset{\displaystyle O}{\overset{\displaystyle \|}{C}}}$ hangi asidin izomeridir?

a) Asetik asit

b) Formik asit

(c) Propiyonik asit

d) Bütirik asit

e) Oksi formik asit

(II Öğrenme Birimi, Öğrenme Hedefi VIA)

26. Aşağıdakilerden hangisi inorganik asidin esteridir?

(a) $C_2H_5-HSO_4$

b) C_2H_5-ONa

c) $CH_3-CO-C_2H_5$

d) C_4H_9-OH

e) $C_2H_4(OH)_2$

(II Öğrenme Birimi, Öğrenme Hedefi IXA)

27. Aşağıdakilerden hangisi elma esteridir?

(a) $CH_3-\underset{\displaystyle O-C_2H_5}{\overset{\displaystyle O}{\overset{\|}{\underset{|}{C}}}}-H$

b) $CH_3-\underset{\displaystyle O-CH_3}{\overset{\displaystyle O}{\overset{\|}{\underset{|}{C}}}}-H$

c) $H-\underset{\displaystyle O-CH_3}{\overset{\displaystyle O}{\overset{\|}{\underset{|}{C}}}}-H$

d) $C_2H_5-\underset{\displaystyle O-C_2H_5}{\overset{\displaystyle O}{\overset{\|}{\underset{|}{C}}}}-H$

e) $C_3H_7-\underset{\displaystyle O-CH_3}{\overset{\displaystyle O}{\overset{\|}{\underset{|}{C}}}}-H$

(II Öğrenme Birimi, Öğrenme Hedefi XIA)

28. Aşağıdakilerden hangisi sıvı yağı gösterir?

a) $C_3H_5(COOC_{17}H_{35})_3$

b) $C_3H_5(COOC_9H_{19})_3$

c) $C_3H_5(COOC_{15}H_{31})_3$

(d) $C_3H_5(COOC_{17}H_{31})_3$

e) $C_3H_5(COOC_{15}H_{33})_3$

(II Öğrenme Birimi, Öğrenme Hedefi XIIIA)

29. $C_3H_5(COOC_{17}H_{35})_3$ katı yağı sabunlaşırsa hangi madde çifti oluşur?

a) $C_{17}H_{35}COOH+C_3H_5OH$

b) $C_{17}H_{35}OH+C_3H_5COOH$

(c) $C_{17}H_{35}COOH+C_3H_5(OH)_3$

d) $C_{17}H_{35}OH+C_3H_5OH$

e) $C_{17}H_{35}COOH+CH_3OH$

(II Öğrenme Birimi, Öğrenme Hedefi XIVA)

30. Aşağıdakilerden hangisi beyaz sabunun formülüdür?

(a) $C_{17}H_{35}COONa$

b) C_3H_7COOK

c) $(C_{15}H_{31}COO)_2Mg$

d) $C_{17}H_{31}COOK$

e) $C_{17}H_{33}COONa$

(II Öğrenme Birimi, Öğrenme Hedefi XVIA)

31. C atom-gr sayıları eşit olan asit ve alkolden oluşan esterin molekül ağırlığı 172 gramdır. Formülü nedir?

a) $C_2H_5-C(=O)-O-C_3H_7$

b) $C_3H_7-C(=O)-O-C_4H_9$

(c) $C_4H_9-C(=O)-O-C_5H_{11}$

d) $CH_3-C(=O)-O-C_2H_5$

e) $H-C(=O)-O-CH_3$

(II Öğrenme Birimi, Öğrenme Hedefi XVIIA)

32. 0,3 molü 103,2 gr olan yağı oluşturan, yağ asidinin mol ağırlığı nedir?

a) 99

b) 100

c) 101

(d) 102

e) 103

(II Öğrenme Birimi, Öğrenme Hedefi XIXA)

33. 23 gr'lik etil alkolün tamami asetik asitle tepkimeye girerek 35,2 gr ester oluşturuyor. Çözeltideki alkol yüzdesi nedir?

a) % 40

b) % 20

c) % 10

(d) % 80

e) % 50

(II Öğrenme Birimi, Öğrenme Hedefi XXIIA)

34. $C_{15}H_{31}-\underset{\underset{O-CH_3}{|}}{C}=O$ esteri hangi madde çiftinden elde edilir?

(a) $C_{15}H_{31}COOH+CH_3OH$

b) $C_8H_{17}COOH+C_8H_{17}O$

c) CH_3 $COOH+C_{15}H_{31}OH$

d) $C_{15}H_{31}OH+CH_3OH$

e) $C_{14}H_{29}COOH+C_2H_5OH$

(II Öğrenme Birimi, Öğrenme Hedefi IIIB)

35. Aşağıdaki organik maddelerden hangisi esterdir?

a) $C_2H_5-CO-C_2H_5$

b) $C_7H_{15}-CHO$

c) $C_{17}H_{35}COOH$

d) $C_5H_{17}OH$

(e) $CH_3-COO-CH_3$

(II Öğrenme Birimi, Öğrenme Hedefi IVB)

36. Etil asetat esterinin izomeri hangi asittir?

a) Propiyonik asit

(b) Bütanoik asit

c) Etanoik asit

d) Pentanoik asit

e) Formik asit

(II Öğrenme Birimi, Öğrenme Hedefi VIB)

37. $C_7H_{15}-COOH+CH_3OH$ madde çifti hangi esteri verir?

a) $CH_3-COO-C_{17}H_{35}$

(b) $C_7H_{15}COO-CH_3$

c) $C_4H_9COO-C_4H_9$

d) $CH_3COO-C_7H_{15}$

e) $C_5H_{11}COO-C_5H_{11}$

(II Öğrenme Birimi, Öğrenme Hedefi XB)

38. Yağ asitlerinin gliserin ile yaptığı esterlere ne ad verilir?

a) Eter

b) alkolat

c) Keton

d) Sabun

(e) Yağ

(II Öğrenme Birimi, Öğrenme Hedefi XIIB)

39. $C_3H_5(COOC_{15}H_{31}OH)_3$ formülü ile gösterilen yağ sabunlaşırsa hangi madde çifti elde edilir?

a) $C_3H_5OH+C_{15}H_{31}OH$

(b) $C_3H_5(OH)_3+C_{15}H_{31}COOH$

c) $C_3H_5(OH)_3+C_{15}H_{31}OH$

d) $C_3H_5COOH+C_{15}H_{31}OH$

e) $C_{15}H_{31}COOH+C_3H_5COOH$

(II Öğrenme Birimi, Öğrenme Hedefi XIVB)

40. Aşağıdakilerden hangisi arap sabunun formülüdür?

a) C_3H_7COONa

b) C_4H_9OK

c) $(C_{15}H_{31}COO)_2Mg$

(d) $C_{17}H_{35}COOK$

e) $C_2H_2O_4Ca$

(II Öğrenme Birimi, Öğrenme Hedefi XVIB)

41. Molekül ağırlığı 102 gr/mol olan esteri oluşturan alkoldeki C atom-gr. sayısı asitteki C atom-gr sayısından 1 fazla olduğuna göre esterin formülü nedir?

(a) $CH_3-C(=O)-O-C_3H_7$

b) $H-C(=O)-O-C_2H_5$

c) $C_2H_5-C(=O)-O-C_3H_7$

d) $CH_3-C(=O)-O-C_2H_5$

e) $C_2H_5-C(=O)-O-C_4H_9$

(II Öğrenme Birimi, Öğrenme Hedefi XVIIB)

42. Molekül ağırlığı 32 gr/mol olan alkolün organik asitle verdiği esterin molekül ağırlığı 88 gr/mol dür. Asidin molekül ağırlığı nedir?

a) 46

b) 52

c) 60

d) 64

(e) 74

(II Öğrenme Birimi, Öğrenme Hedefi XVIIIB)

43. 4,4 gr. propiyonik asid metil esteri elde etmek için % 64 lük kaç gr. CH_3OH gerekir?

a) 4

b) 3

c) 3,5

(d) 2,5

e) 1,5

(II Öğrenme Birimi, Öğrenme Hedefi XXIB)

44. 23,2 gr. ananas esteri elde etmek için 10 gr etil alkol kullanılıyor. Alkol % kaçlıktır?

a) 96

(b) 92

c) 90

d) 86

e) 82

(II Öğrenme Birimi, Öğrenme Hedefi XXIIB)

45. Aşağıdakilerden hangisi segonder (ikincil) amindir?

a) CH_3-NH_2

(b) $CH_3-NH-CH_3$

c) $(CH_3)_3N$

d) $CH_3-CO-NH_2$

e) NH_3

(III Öğrenme Birimi, Öğrenme Hedefi IIIA)

46. [$C_2H_5-NH_2$ + CH_3-Cl] tepkimesi aşağıdakilerden hangi organik bileşiği oluşturur?

a) $(C_2H_5)Cl$

(b) $C_2H_5-NH-CH_3$

c) CH_3-Cl

d) CH_3NH_2

e) $(C_3H_7)NH_2$

(III Öğrenme Birimi, Öğrenme Hedefi VA)

47. $C_2H_5-\underset{\displaystyle NH_2}{\overset{\displaystyle |}{C}}=O$ bileşiğinin adı aşağıdakilerden hangisidir?

a) Formamid

b) Asetamid

(c) Propiyonamid

d) Metil amin

e) Dietil amin

(III Öğrenme Birimi, Öğrenme Hedefi VIIIA)

48. Asetamid aşağıdaki hangi madde çiftinden elde edilir?

(a) $CH_3CO-Cl + NH_3$

b) $C_2H_5COOH + NH_3$

c) $NH_3 + CH_3 - Cl$

d) $H-COOH + NH_3$

e) $H-CO-Cl + NH_3$

(III Öğrenme Birimi, Öğrenme Hedefi IXA)

49. Amidlerin sulandırılmış HCl ile tepkimesi hangi organik bileşiği verir?

a) Aldehit

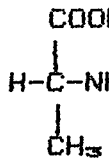
b) Keton

(c) Asit

d) Eter

e) Ester

(III Öğrenme Birimi, Öğrenme Hedefi XIA)

50.  bileşiğinin cenevre sistemine göre adı nedir?

a) ß amino propiyonik asit

b) α amino bütanoik asit

c) 1 amino etanoik asit

(d) α amino propiyonik asit

e) amino asetik asit

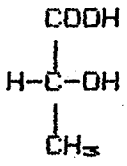
(III Öğrenme Birimi, Öğrenme Hedefi XIIIA)

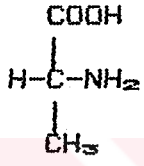
51. Aşağıdaki bileşiklerden hangisi amfoter özellik gösterir?

a) C_2H_5COOH

b) C_3H_7-OH

c) $C_6H_{11}-NH_2$

d)


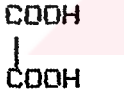
(e)


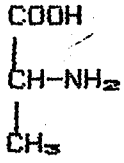
(III Öğrenme Birimi, Öğrenme Hedefi XVA)

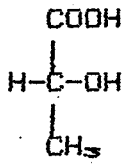
52. Hangi asit iç tuz oluşturur?

a) CH_3COOH

b) $H-COOH$

c)


(d)


e)


(III Öğrenme Birimi, Öğrenme Hedefi XVIA)

53. 1 mol HCl ile 110 gr. alkil amonyum klorür veren primer (birincil) aminin formülü nedir?

a) CH_3NH_2

b) $C_2H_5NH_2$

(c) $C_4H_9NH_2$

d) $C_3H_7NH_2$

e) $C_6H_{11}NH_2$

(III Öğrenme Birimi, Öğrenme Hedefi XVIIIA)

54. 17,4 gr. amid elde ediminde oluşan HCl'u 0,2 mol NaOH nötralleştirdiğine göre amidin formülü nedir?

a) $C_3H_7-NH_2$

(b) $C_3H_7-\underset{\displaystyle NH_2}{\overset{\displaystyle O}{\overset{\|}{C}}}$

c) C_3H_7-OH

d) $C_3-\underset{\displaystyle NH_2}{\overset{\displaystyle O}{\overset{\|}{C}}}$

e) $H-\underset{\displaystyle NH_2}{\overset{\displaystyle O}{\overset{\|}{C}}}$

(III Öğrenme Birimi, Öğrenme Hedefi XXA)

55. Açillendirilmiş amonyak aşağıdakilerden hangisidir?

a) Amin

b) Asit

c) Amino asit

(d) Amid

e) Alkil amonyum tuzu

(III Öğrenme Birimi, Öğrenme Hedefi VIIA)

56. Aşağıdaki bileşiklerden hangisinin sudaki çözeltisi kuvvetli bazik özellik gösterir?

a) C_2H_5OH

b) $Fe(OH)_2$

c) NH_3

d) $H-\underset{\underset{O}{\|}}{C}-NH_2$

e) $C_2H_5-NH_2$

(III Öğrenme Birimi, Öğrenme Hedefi IB)

57. Aşağıdaki bileşiklerden hangisi amindir?

(a) $C_2H_5-NH_2$

b) CH_3-CN

c) $CH_3-\underset{\underset{NH_2}{|}}{C}=O$

d) $H_2C-\underset{\underset{NH_2}{|}}{C}OOH$

e) $C_2H_5-\underset{\underset{O-NH_4}{|}}{C}=O$

(III Öğrenme Birimi, Öğrenme Hedefi IIIB)

58. $(C_3H_7)_2-NH + HCl$ tepkimesi hangi organik bileşiği verir?

a) $(C_3H_7)_2Cl$

(b) $[(C_3H_7)_2NH_2]$

c) C_3H_7OH

d) NH_4Cl

e) C_6H_{14}

(III Öğrenme Birimi, Öğrenme Hedefi VIB)

59. $H-C=O$ bileşiğinin adı cenevre sistemine göre nedir?
$|$
NH_2

a) Asetamid

(b) Formamid

c) Metil amin

d) Di etil amin

e) Propiyonamid

(III Öğrenme Birimi, Öğrenme Hedefi VIIIB)

60. Formamid hangi madde çiftinden elde edilir?

a) $CH_3CO-Cl + NH_3$

b) $C_2H_5-CO-Cl + NH_3$

c) CH_3OH+NH_3

(d) $H-CO-Cl+NH_3$

e) $C_2H_5-OH + NH_3$

(III Öğrenme Birimi, Öğrenme Hedefi IXB)

61. Amidler sulandırılmış inorganik asitlerle hangi organik bileşiği oluşturur?

(a) Asit

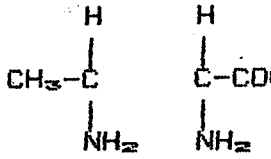
b) Aldehit

c) Keton

d) Eter

e) Ester

(III Öğrenme Birimi, Öğrenme Hedefi XIB)

62.  bileşiğinin cenevre sistemine göre adı nedir?

a) 2,2 di amino asit

(b) α, β di amino bütanoik asit

c) β, ϒ amino propiyonik asit

d) 2 amino etonoik asit

e) Bütonoik asit

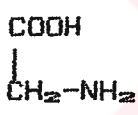
(III Öğrenme Birimi, Öğrenme Hedefi XIIIB)

63. Hangi bileşik anfoter özellik gösterir?

a) C_2H_5OH

b) $(CH_3)_2Co$

c) HCOOH

(d) 

e) CH_3 O CH_3

(III Öğrenme Birimi, Öğrenme Hedefi XVB)

64. 0,2 mol alkolün oluşturduğu amin 9 gr. olduğuna göre, aminin formülü nedir?

a) CH_3-NH_2

b) $C_3H_7-NH_2$

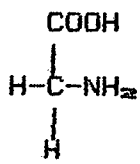
c) $C_5H_{11}-NH_2$

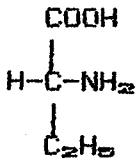
(d) $C_2H_5-NH_2$

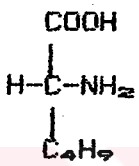
e) $C_4H_9-NH_2$

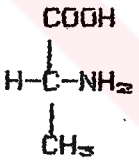
(III Öğrenme Birimi, Öğrenme Hedefi XVIIIB)

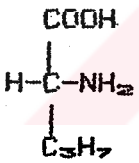
65. 0,2 M. 200 cm^3 HCl çözeltisi, 3,65 gr. amino asitle tepkimeye girdiğine göre asidin bileşim formülü nedir?

a) 

b) 

c) 

(d) 

e) 

(III Öğrenme Birimi, Öğrenme Hedefi XIXB)

66. Benzenin kimyasal özellikleri hangi alifatik bileşikleri andırır?

a) Alken

b) Alkin

(c) Alkan

d) Alkol

e) Asit

(IV Öğrenme Birimi, Öğrenme Hedefi IIIA)

67. Benzen halojenlerle hangi tip tepkime ile reaksiyona girer?

a) Katılma

b) Polimerizasyon

c) Kondensasyon

(d) Ornatma

e) Sabunlaşma

(IV Öğrenme Birimi, Öğrenme Hedefi VA)

68. Benzen H_2 ile Ni katalizörlüğünde hangi bileşiği verir?

a) Tri H_2 benzen

(b) Çiklo hegzan

c) Di H_2 benzen

d) Mono hidrojen benzen

e) Tri klor benzen

(IV Öğrenme Birimi, Öğrenme Hedefi VIA)

69. Benzen 1 kere sülfolandırılırsa hangi aromatik bileşiği verir?

(a) $C_6H_5(HSO_3)$

b) $C_6H_4(HSO_3)_2$

c) $C_6H_5(NO_3)$

d) $C_6H_3(HSO_3)_3$

e) $C_6H_5\ SO_4$

(IV Öğrenme Birimi, Öğrenme Hedefi VIIIA)

70. Aşağıdakilerden hangisi toluenin formülüdür?

a) C_6H_5-OH

b) C_6H_5-Cl

c) $C_6H_4-Cl_2$

d) $C_6H_5-NH_2$

(e) $C_6H_5-CH_3$

(IV Öğrenme Birimi, Öğrenme Hedefi XA)

71. Aşağıdakilerden hangisi toluenin eldesidir?

(a) $C_6H_5-I + 2Na + CH_3-I \longrightarrow NaI + C_6H_5-CH_3$

b) $NH_4CNO \longrightarrow NH_2-CO-NH_2$

c) $C_5H_{11}-COOH + H_2 \longrightarrow C_5H_{11}-CHO + H_2O$

d) $C_6H_6-Cl_2 \longrightarrow C_6H_5-Cl + HCl$

e) $C_2H_5OH + 3O_2 \longrightarrow 2CO_2 + 3H_2O$

(IV Öğrenme Birimi, Öğrenme Hedefi XIA)

72. Aşağıdakilerden hangisi antrasenin genel formülüdür?

a) C_7H_{14}

b) C_{7H16}

c) C_7H_{12}

(d) $C_{14}H_{10}$

e) $C_{14}H_{28}$

(IV Öğrenme Birimi, Öğrenme Hedefi XIVA)

73. 15,6 gr. benzeni 1 defa klorlandırmak için N.K. kaç lt CL_2 gazı gerekir?

a) 5,6

b) 11,2

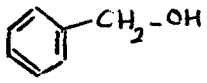
c) 2,24

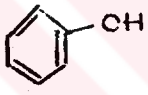
d) 44,8

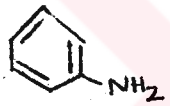
(e) 4,48

(IV Öğrenme Birimi, Öğrenme Hedefi XVIA)

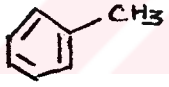
74. Aşağıdaki bileşiklerden hangisi asit özelliği gösterir?

a) 

(b) 

c) 

d) C_2H_5OH

e) 

(IV Öğrenme Birimi, Öğrenme Hedefi XVIIIA)

75. 18,8 gr. fenol, 200 cm^3'lük NaOH ile tepkimeye giriyor. NaOH'in molar derişimi nedir?

(a) 1

b) 2

c) 0,5

d) 0,2

e) 0,1

(IV Öğrenme Birimi, Öğrenme Hedefi XXA)

76. Sodyum benzoatin ısıtılmasından hangi aromatik hidrokarbon elde edilir?

(a) Benzen

b) Fenol

c) Toluen

d) Antrasen

e) Naftalin

(IV Öğrenme Birimi, Öğrenme Hedefi IIB)

77. Benzen 2 mol I_2 ile hangi aromatik bileşiği verir?

a) C_6H_5I

(b) $C_6H_4I_2$

c) $C_6H_3I_3$

d) $C_6H_2I_4$

e) C_6HI_5

(IV Öğrenme Birimi, Öğrenme Hedefi IVB)

78. Çiklohegzan; benzenin hangi element ile tepkimesinden oluşur?

a) Ni

b) Cu

(c) H_2

d) Cl_2

e) I_2

(IV Öğrenme Birimi, Öğrenme Hedefi VIB)

79. Benzen 1 kere sulfalandırılırsa hangi bileşik elde edilir?

a) Toluen

b) Dinitro benzen

(c) Benzen sülfon asidi

d) Tri nitro toluen

e) Para nitro toluen

(IV Öğrenme Birimi, Öğrenme Hedefi VIIIB)

80. $C_6H_5-CH_3$ bileşiğinin adı nedir?

a) Benzen

b) Fenol

c) Naftalin

(d) Toluen

e) Benzoik asit

(IV Öğrenme Birimi, Öğrenme Hedefi XB)

81. Aşağıdakilerden hangisi toluenin elde edilme tepkimesidir?

a) $3C_2H_2 \longrightarrow C_6H_6$

(b) $C_6H_6 + CH_3-Cl \longrightarrow C_6H_5-CH_3 + HCl$

c) $C_6H_{10} + \frac{17}{2} O_2 \longrightarrow 6CO_2 + 5H_2O$

d) $C_6H_6 + 3Cl_2 \longrightarrow C_6H_6Cl_6$

e) $C_6H_6 + HNO_3 \longrightarrow C_6H_5NO_3 + H_2O$

(IV Öğrenme Birimi, Öğrenme Hedefi XIB)

82. Aşağıdakilerden hangisi naftalinin H_2 ile tepkimesinden elde edilir?

(a) Dekalin

b) Anilin

c) Benzil

d) Toluen

e) Fenol

(IV Öğrenme Birimi, Öğrenme Hedefi XIIIB)

83. 46,8 gr. benzeni iki kere klorlamak için N.Ş. kaç litre Cl_2 gereklidir?

a) 13,44

(b) 26,88

c) 40,32

d) 8,96

e) 4,48

(IV Öğrenme Birimi, Öğrenme Hedefi XVIB)

84. 20 gr. benzen-çikloheqzan karışımı bir kere sülfolandırmak için 0,2 M, 500 cm^3 H_2SO_4 kullanılıyor. Karışımda benzen %'si kaçtır?

a) % 78

b) % 40

c) % 80

(d) % 39

e) % 50

(IV Öğrenme Birimi, Öğrenme Hedefi XVB)

85. 200ml. benzoik asit 4,6 gr. etil alkol ile esterleştiğine göre asidin molar derişimi nedir?

a) 0,05

b) 5

(c) 0,5

d) 0,005

e) 1,5

(IV Öğrenme Birimi, Öğrenme Hedefi XXB)

MATEMATİK TESTİ

Yönerge: Bu bölümde sizlere toplam 33 soru verilmiştir. Bu bölüm için önerilen cevaplama süresi 50 dakikadır. Bu bölümdeki sorularla ilgili cevabınızı, cevap anahtarının "Matematik Testi" bölümüne işaretleyerek belirtiniz.

1. $P(x-3)=(x^2+x+1).Q(x)+2x+1$ ve $P(x)$'in $(x-4)$ ile bölümünden kalan 5 ise, $Q(x)$'in $(x-7)$ ile bölümünden kalan aşağıdakilerden hangisidir?

a) $\frac{-5}{12}$

(b) $\frac{-10}{57}$

c) $\frac{14}{29}$

d) $\frac{-16}{29}$

e) $\frac{-5}{28}$

2. $\dfrac{\sqrt{10}}{\sqrt{6}-\sqrt{10}} + \dfrac{\sqrt{21}}{\sqrt{35}-\sqrt{21}}$ ifadesinin en sade hali aşağıdakilerden hangisidir?

(a) -1

b) $\dfrac{\sqrt{6}}{\sqrt{21}}$

c) $\dfrac{\sqrt{11}}{\sqrt{23}}$

d) 1

e) 0

3. $(1 + 5^{1/8}).(1+5^{1/4}).(1 + 5^{1/2})$ ifadesinin en sade şekli aşağıdakilerden hangisidir?

a) -2

b) $(1-5^{1/2})$

c) $(1-5^{1/4})$

(d) $-4.(1-5^{1/8-1})$

e) 1

4. 220 lirayı, A, B, C, arasında öyle pay edin ki A ve B'nin aldıkları 2 ve 5 ile doğru orantılı C'nin aldığı 3 ile ters orantılı olsun.

(a) A= 60 B= 150 C= 10

b) A= 80 B= 130 C= 10

c) A= 75 B= 125 C= 20

d) A= 30 B= 90 C=100

e) A= 75 B= 125 C= 20

5. $\left|\, x + \left|\, -1 + \left|\, x - 1 \,\right| \,\right| \,\right|$ ifadesinin sonucu $x<0$ için aşağıdakilerden hangisidir?

a) $-2x$

b) x

(c) 0

d) $-x$

e) $2x$

6. $5.2^{x} + 2.2^{x+1} = 36$ ise x aşağıdakilerden hangisine eşittir?

a) -1

b) 1

c) 0

d) -2

(e) 2

7. $\frac{2x + 3y}{4x} = 3 \Longrightarrow \frac{5x + 2y}{3y}$ ifadesi aşağıdakilerden hangisine eşittir?

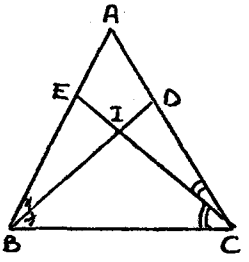
a) $\frac{2}{5}$

(b) $\frac{7}{6}$

c) $\frac{3}{6}$

d) $\frac{1}{6}$

e) $-\frac{3}{7}$

8. 

m $\hat{BEC}$= 95°
m $\hat{MOC}$= 82°

ise $\hat{MA}$ aşağıdakilerden hangisine eşittir?

a) 116°

b) 119°

c) 115°

(d) 58°

e) 107°

9. $x^4 - 7x^3 - 8 = 0$ denklemi için aşağıdakilerden hangisi doğrudur?

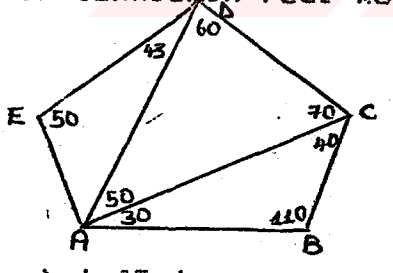
a) Denklemin 6 reel kökü vardır.

b) Denklemin 4 reel kökü vardır.

c) Denklemin 3 reel kökü vardır.

(d) Denklemin 2 reel kökü vardır.

e) Denklemin reel kökü yoktur.

10. 

Şekildeki beşgende en uzun kenar aşağıdakilerden hangisidir?

a) | AB |

b) | BC |

(c) | CD |

d) | DE |

e) | AE |

11. $X^2 + (m - 2).x + 4 = 0$ ve $x^2 - mx + 5 = 0$ denklemleri veriliyor. Birinci denklemin köklerinin birer fazlası, ikinci denklemin kökleri olduğuna göre m nedir?

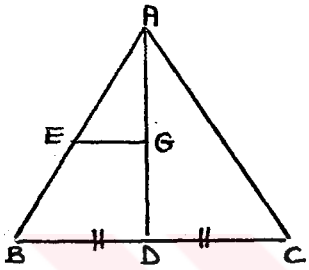
a) 0

b) -4

(c) 2

d) 4

e) -2

12. 

Şekildeki ABC de [AD] kenarortay, G ağırlık merkezi ve [EG] // [BC] olduğuna göre A(BDGE)nin alanının A(ABC) alanına oranı nedir?

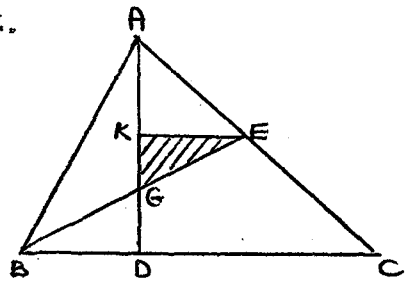
a) $\frac{1}{6}$

b) $\frac{2}{9}$

c) $\frac{5}{9}$

(d) $\frac{5}{18}$

e) $\frac{5}{24}$

13. 

Şekildeki $\hat{ABC}$'de [AD] ve [BE] kenar ortayıdır. [KE] // [BC] olduğuna göre $\frac{A(\hat{GEK})}{A(\hat{ABC})}$ aşağıdakilerden hangisidir?

a) 1/6

b) 1/12

c) 1/9

(d) 1/24

e) 1/16

14. $0° \leq x \leq 90°$ ve $tgx = a$ ise $Cos2x$ ifadesinin eşidi aşağıdakilerden hangisidir?

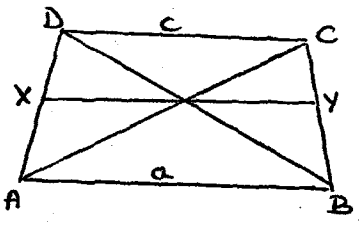
a) $\frac{a^2}{1 + a^2}$

b) $\frac{1 + a^2}{a^2}$

c) $1-a^2$

(d) $\frac{1 - a^2}{1 + a^2}$

a) $\frac{1 + a^2}{1 - a^2}$

15. 

Şekildeki ABCD yamuğunda [XY]//[AB]//[CD] olduğuna göre | XY | aşağıdakilerden hangisine eşittir?

a) $\frac{ac}{a+c}$

(b) $\frac{2ac}{a+c}$

c) $\frac{a+c}{2ac}$

d) $\frac{a+c}{ac}$

e) $\frac{2(a+c)}{ac}$

16. $z = \sqrt{2} - \sqrt{2}\,i$ ise Arg(z) ifadesi aşağıdakilerden hangisine eşittir?

a) 45°

b) 120°

c) 210°

d) 325°

(e) 315°

17. $\vec{A}$ ve $\vec{B}$ vektörleri arasındaki açının ölçüsü 120°dir. $|\vec{A}|=3$ ve $|\vec{B}|=5$ ise $|\vec{A} + \vec{B}|=$ ifadesinin eşiti aşağıdakilerden hangisidir?

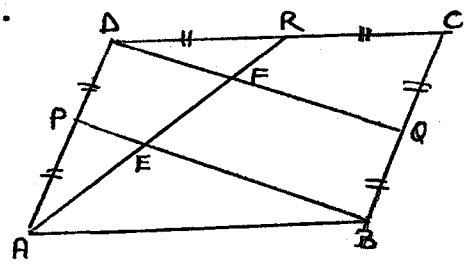
a) 7

(b) $\sqrt{19}$

c) 6

d) 8

e) 4

18. 

Şekildeki $\square ABCD$ paralel kenarında P, Q, R noktaları kenarların ortanoktalarıdır. $|AR|=15$ olduğuna göre $|EF|$ aşağıdakilerden hangisine eşittir?

a) 10

(b) 6

c) 9

d) 12

e) 8

19. $\log_x 4^x=4$ olması için x aşağıdakilerden hangisine eşit olmalıdır?

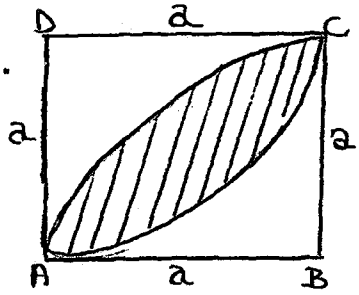
a) 2

(b) 4

c) 8

d) 16

e) 1/2

20. 

Şekildeki taralı alan aşağıdakilerden hangisine eşittir?

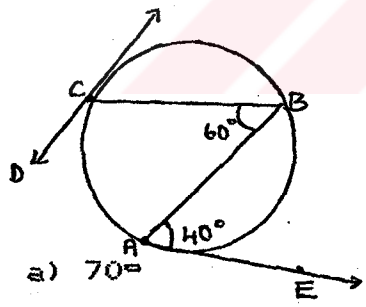
(a) $\frac{a^2(\pi-2)}{2}$

b) $\frac{a^2(\pi-3)}{2}$

c) $\frac{a^2(\pi-2)}{3}$

d) $\frac{a^2(\pi-1)}{4}$

e) $\frac{a^2(\pi-1)}{3}$

21. 

Şekildeki CD ve AE çembere teğettir. m $(\hat{BAE})=40^\circ$, m $(\hat{CBA})=60^\circ$ olduğuna göre m $(\hat{DCB})$ aşağıdakilerden hangisine eşittir?

a) 70°

b) 95°

c) 75°

(d) 100°

e) 80°

22. Bir düzlemde herhangi ikisi paralel olmayan herhangi üçü 1 noktadan geçmeyen 15 doğru kaç üçgen oluşturur?

a) 15

b) 45

c) 325

d) 400

(e) 455

23. $\lim_{x \to \pi/2} \frac{1-\sin x}{\cos x}$ ifadesinin değeri aşağıdakilerden hangisidir?

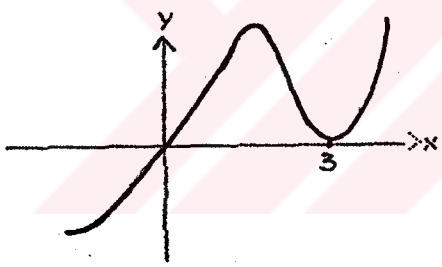
a) ∞

b) $\sqrt{2}$

c) 1

(d) 0

e) 1/2

24. 

Yandaki grafiğin fonksiyonu aşağıdakilerden hangisi olabilir?

a) $y = x(x+3)^2$

b) $y = x^2(x+3)$

(c) $y = x(x-3)^2$

d) $y = -x(x-3)$

e) $y = x^2(x-3)$

25. $y = \dfrac{x^2+mx+2}{x-2}$ fonksiyonuna başlangıç noktasından çizilen teğetin x eksenine paralel olması için "m" ne olmalıdır?

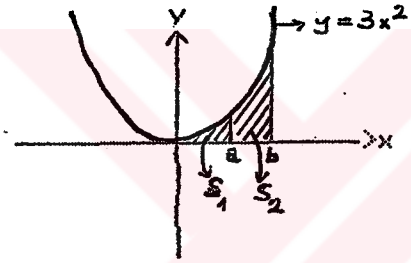
a) 0

b) 1

c) 2

(d) -1

e) -2

26. 

Yanda verilen $y=3x^2$ denkleminin grafiğinde $a/b=1/2$'dir. Buna göre S_1/S_2 aşağıdakilerden hangisidir?

a) 1/2

b) 1/4

c) 1/8

d) 1/3

(e) 1/7

27. $A=\begin{bmatrix} a & b \\ 2a & 2 \end{bmatrix}$, $B=\begin{bmatrix} a & -b \\ b & -3 \end{bmatrix}$ matrisleri veriliyor.

AxB matrisi $\begin{bmatrix} 15 & 4 \\ 5 & 0 \end{bmatrix}$ ise, (a + b) aşağıdakilerden hangisi olabilir?

a) 0

b) 1

c) -1

(d) 3

e) 2

28. $A=\begin{vmatrix} x-2 & -2 \\ 2 & x+2 \end{vmatrix}$ determinanti veriliyor. detA=25 ise, x aşağıdakilerden hangisi olabilir?

a) $\sqrt{17}$

(b) 5

c) $\sqrt{33}$

d) $\sqrt{21}$

e) $\sqrt{29}$

29. Köşeleri A(2,5), B(-1,4), C(5,3) olan ABC üçgeninin ağırlık merkezinin koordinatları aşağıdakilerden hangisidir?

a) (1,2)

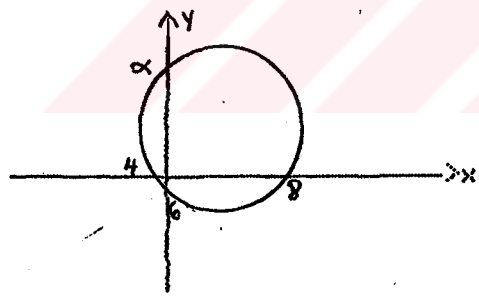
(b) (2,4)

c) (-2,4)

d) (2,-4)

e) (-2,-4)

30.



Yandaki çemberin denklemi aşağıdakilerden hangisidir?

a) $(x-8)^2 + (y-7)^2 = 65$

(b) $(x-7)^2 + (y-8)^2 = 65$

c) $(x+8)^2 + (y-7)^2 = 65$

d) $(x+8)^2 + (y+7)^2 = 65$

e) $(x+7)^2 + (y-8)^2 = 65$

31. $f(x) = \dfrac{x^2 + 4x + 1}{x^2 + 2x + a - 28}$ fonksiyonu $x=4$ noktasında süreksiz olduğuna göre "a" aşağıdakilerden hangisi olabilir?

(a) 4

b) -4

c) 2

d) -2

e) 1

32. $\int_{-\pi}^{\pi} |\sin x|\, dx$ integralinin değeri aşağıdakilerden hangisidir?

a) -2

b) -1

c) 0

d) 2

(e) 4

33. Bir bilye oyununda 4 bilye sırasıyla 4 çukura atılıyor. Atılan ilk 3 bilye farklı çukurlara düştüğüne göre, bir çukurda 2 bilye bulunması olasılığı nedir?

a) $\frac{1}{4}$

b) $\frac{1}{2}$

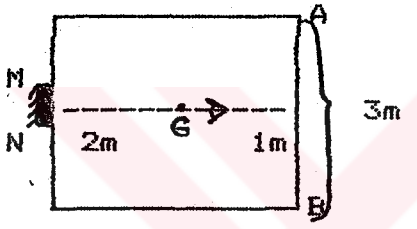
(c) $\frac{3}{4}$

d) 1

e) $\frac{1}{3}$

FEN BİLİMLERİ TESTİ

Yönerge : Bu bölümde sizlere toplam 48 soru verilmiştir. Bu bölüm için önerilen cevaplama süresi 70 dakikadır. Bu bölümdeki sorularla ilgili cevabınızı, cevap anahtarının "Fen Bilimleri Testi" bölümüne işaretleyerek belirtiniz.

1. 

Kenarı 1 m olan kare şeklindeki bir düz ayna, küp şeklindeki odanın duvarının tam ortasına asılmıştır. G noktasında bulunan bir gözlemci AB duvarının kaç m^2'lik bölümünü görebilir?

a) 1,5

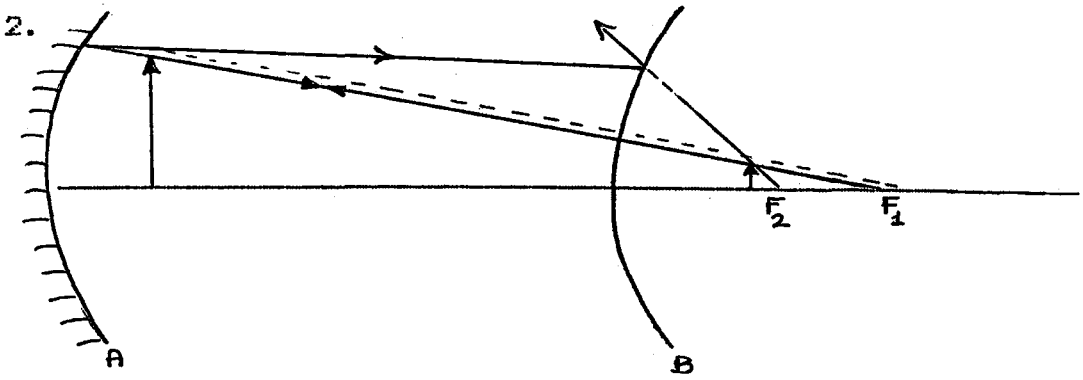
b) 2,5

c) 3

(d) 6,25

e) 9

2.



Şekildeki optik çizimde, çizim ve görüntü için aşağıdaki yargılardan hangisi doğrudur?

a) Çizim doğru, görüntü gerçektir.

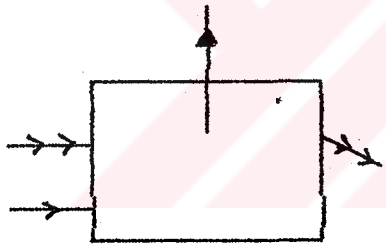
b) Çizim doğru, görüntü sanaldır.

(c) B aynasındaki yansıma hatalı çizilmiştir.

d) A aynasındaki yansıma hatalı çizilmiştir.

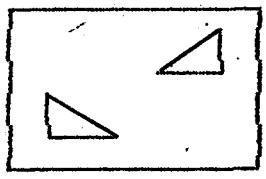
e) Bu optik sistemin bütünü hatalı çizilmiştir.

3.

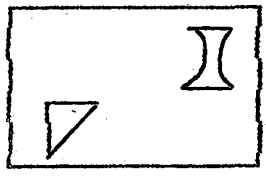


Tek renkli iki ışın, bir kutuya şekildeki gibi girip çıkıyor. Bu kutuya, aşağıdakilerden hangisine benzer bir optik düzenek konulmuş olabilir?

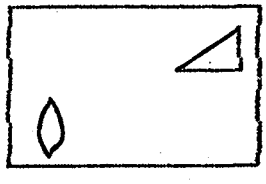
a)



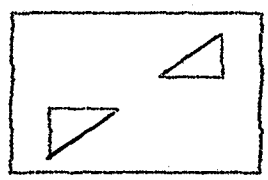
b)



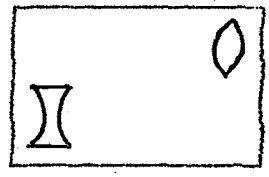
c)



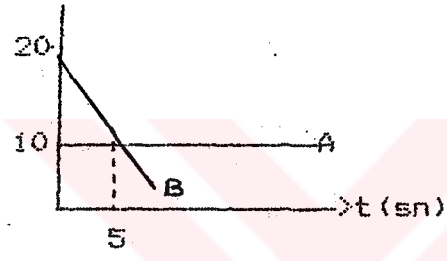
(d)



e)



4) v(m/sn)



Aynı noktadan aynı yöne doğru hareket eden iki hareketlinin hız-zaman grafiği şekildeki gibidir. A hareketlisi B hareketlisine kaç sn. sonra yetişir?

a) 2

b) 4

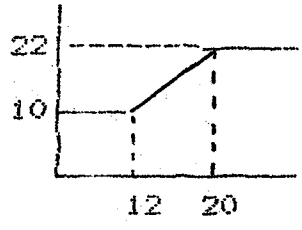
c) 6

d) 8

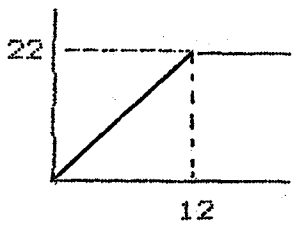
(e) 10

5. Bir cisim 10 m/sn'lik bir ilk hızla harekete geçerek 12 saniye süre ile 1 m/sn²'lik ivme ile hızlanıyor ve sonra 20 saniyeye kadar kazandığı hız ile yoluna devam ediyor. 20 saniyelik hareket için cismin hareketinin hız zaman grafiğini aşağıdakilerden hangisi en iyi açıklar?

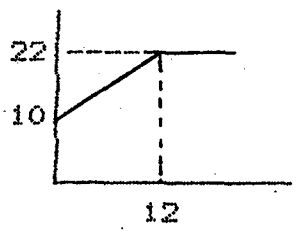
a)



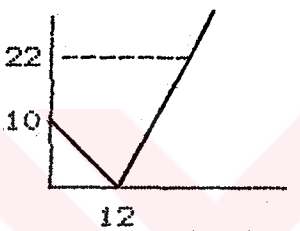
b)



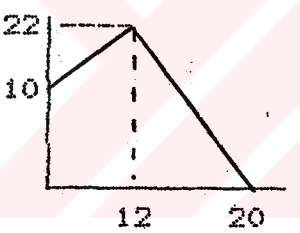
(c)



d)

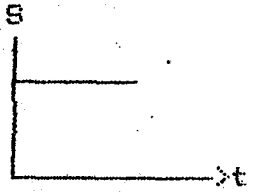


e)

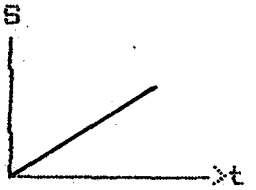


6. Sükünetten sabit bir kuvvetin etkisiyle hareket ettirilen bir cismin aldığı yolun zamanla değişimini gösteren grafik aşağıdakilerden hangisidir? (sürtünme ihmal)

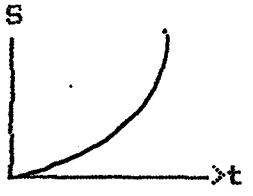
a) S



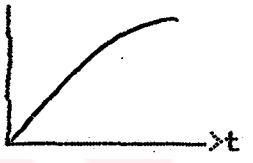
b) S



(c) S

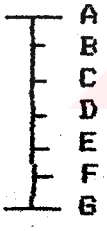


d) S



e) S

7.



A noktasından serbest bırakılan bir taş, birinci saniye sonunda B noktasından geçiyor. Bu andan itibaren geçen bir saniye sonunda taş hangi noktadan geçer? (AB=BC=CD=DE=EF=FG)

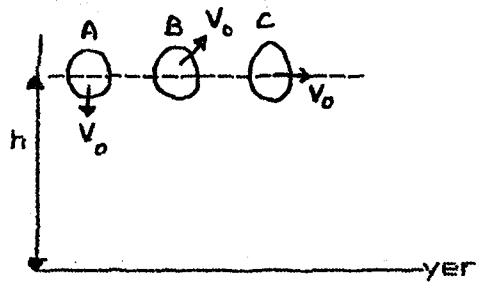
a) C

b) D

(c) E

d) F

e) G

8. 

Şekildeki A, B, C küreleri aynı yükseklikten, şekildeki gibi aynı V_o hızı ile atılıyor. Bu kürelerin yere çarptığı andaki hızları için aşağıdaki seçeneklerden hangisi doğrudur?

a) $V_A > V_B > V_C$

b) $V_A > V_B > V_C$

(c) $V_B > V_A > V_C$

D) $V_A > V_B = V_C$

b) $V_A = V_B = V_C$

9. A gezegeninin kütlesi, dünyanın kütlesinin 4 katı, yarıçapı ise yer yarıçapının 4 katıdır. A gezegeninde ip boyu 2,5 m olan bir sarkacın periyodu kaç sn'dir? ($g = 10\ m/sn^2$ alınız)

a) π

b) $\pi/2$

(c) 2π

d) $3\pi/2$

e) 4π

10. Yük miktarı $+4x10^{14}$ elm.yük olan bir küreye, bununla özdeş olan yüksüz ikinci bir küre dokunduruluyor. Dokunmadan sonra küreler bir metre aralıkla konuluyorlar. Kuvvet kaç Newtondur? ($k=2,3x10^{-28}$ Nt.m^2/elm.yük^2)

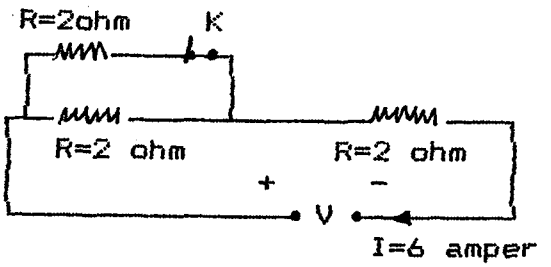
a) 4,6

(b) 9,2

c) 46

d) 92

e) 36,8

11. 

Şekildeki devreden, K anahtarı açıkken geçen akım şiddeti 6 amperdir. Anahtar kapanınca ana koldaki akım şiddeti kaç amper olur?

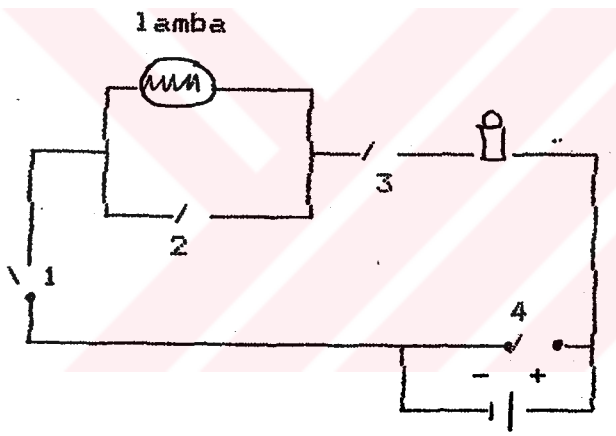
a) 4

b) 4,5

c) 6

(d) 8

e) 9

12. 

Şekildeki devrede, zil çalarken lambanın da yanabilmesi için hangi anahtarların kapatılması gerekir?

a) 1-3

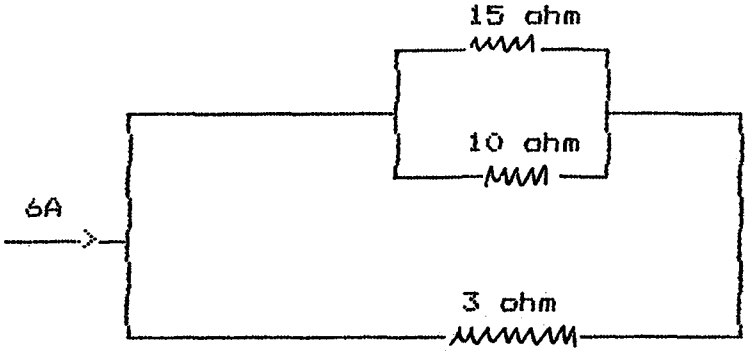
b) 2-3

c) 3-4

(d) 1-2-4

e) 2-3-4

13.



Şekildeki görülen elektrik devresindeki verilere göre 3 ohm'luk direnç üzerindeki sarfiyat kaç watt'tır?

(a) 48

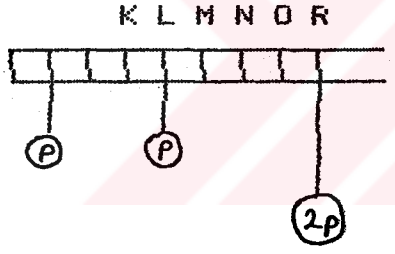
b) 12

c) 16

d) 30

e) 6

14.



Şekildeki eşit bölmeli çubuğun yatay olarak dengede kalabilmesi için hangi aralıkta bulunan bir noktadan asılmış olması gerekir?
(Çubuğun ağırlığı önemsenmeyecektir.)

a) KL

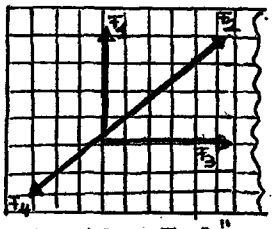
b) LM

(c) MN

d) NO

e) OR

15. M noktasal parçacığına, şekil düzlemindeki 4 kuvvet etki ediyor. Bu parçacık hangi iki kuvvetin bileşkesi yönünde hareket eder?



(a) F_1 ile F_3'ün

b) F_1 ile F_2'nin

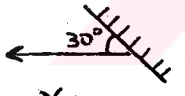
c) F_3 ile F_4'ün

d) F_1 ile F_4'ün

e) F_2 ile F_3'ün

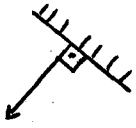
16. Şekilde kesiti gösterilen doğrusal dalga ok yönünde ilerlediğine göre engelde yansıdıktan sonra hangi yönde ilerler?

a)

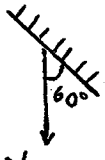


b)

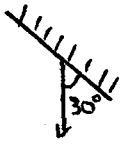
c)



d)



(e)



17. Bir uçak 2 km yarıçapındaki düşey bir dairesel yörüngede takla atarak dönmektedir. Uçak yörüngenin en üst noktasında iken pilot ağırlıksız olduğuna göre uçağın hızı nedir?

a) 100 m/sn

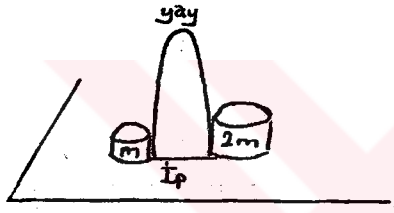
b) $10\sqrt{2}$ m/sn

c) $\sqrt{2}$ m/sn

(d) $100\sqrt{2}$ m/sn

e) 10 m/sn

18.



Şekilde yatay ve sürtünmesiz bir masa üzerinde kütleleri m ve 2m olan iki disk görülüyor. Aralarına bir yay sıkıştırılmış diskler bir iple birbirine bağlanmıştır. İp yakılınca kütleler harekete geçiyor. Bu etkileşmede disklerin momentumu için en doğru yargı aşağıdakilerden hangisidir?

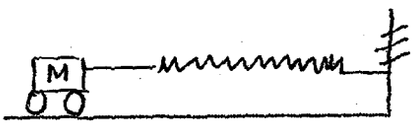
a) Büyuk kütleli diskin momentumu büyüktür.

b) m kütleli diskin momentumu diğerinin iki katıdır.

c) Kütlesi küçük olan diskin momentumu büyüktür.

(d) Disklerin toplam momentumu sıfırdır.

e) 2m kütleli diskin momentumu diğerinin iki katıdır.

19. 

Yatay ve sürtünmesiz bir masada kütlesi 2,5 kg. olan bir araba bir sarmal yaya bağlanmıştır. Araba şekilde görüldüğü gibi bir F kuvveti ile 20 cm çekilip bırakılanca periyodu 2 sn olan basit harmonik hareket yapıyor. Bu hareket sırasında yaya aktarılan en büyük potansiyel enerji kaç joule'dür?
($\pi^2 = 10$ alınız.)

(a) 0,5

b) 0,75

c) 1

d) 2,5

e) 5

20. Yatayla 37°lik açı yapan düzlem üzerinde bulunan 20 kg'lik bir cismi, yukarıya doğru harekete başlatmak için en az kaç kg'lik bir kuvvet gerekir?
(Cisimle düzlem arasındaki sürtünme katsayısı $\mu = 0,2$dir.)

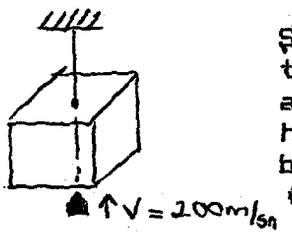
a) 12

b) 14,4

(c) 15,2

d) 16

e) 18

21. 

Şekildeki gibi ipe asılmış 90 gr'lık bir tahta parçasına 10 gr'lık bir mermi, aşkı ip doğrultusunda 200 cm/sn'lik hızla çarpıp saplanıyor. Bu mermiyle birlikte tahta kaç cm yükselir?
($g = 1000$ cm/sn^2)

a) 1/100

(b) 1/125

c) 20/81

d) 20/9

e) 20

22. Fe ve S bulunduran bir bileşiğin 0,4 molu 1,1 mol O_2 ile tepkimeye girdiğinde 0,2 mol Fe_2O_3 ve bir miktar SO_2 oluşuyor. İlk bileşiğin formülü nedir?

a) Fe_2S

(b) FeS_2

c) Fe_3S_4

d) Fe_2S_3

e) FeS

23. Oda koşullarında 100 gr suda en çok 220 gr $AgNO_3$ çözünmektedir. 44 gr $AgNO_3$'ten aynı koşulda kaç gram doymuş çözelti hazırlanır?

a) 20

b) 44

c) 50

(d) 64

e) 144

24. 30 gr X_2 ve bir miktar Y_2'den 36 gr Z oluşmaktadır. Bu tepkimenin denklemi aşağıdakilerden hangisidir? (X=15, Y=1, Z=18)

a) $2X_2+6Y_2 \longrightarrow 2Z$

b) $2X_2+3Y_2 \longrightarrow 2Z$

(c) $X_2+3Y_2 \longrightarrow 2Z$

d) $X_2+6Y_2 \longrightarrow Z$

e) $X_2+3Y_2 \longrightarrow Z$

25. X, Y, Z metallerinden; X, HCl ve H_2SO_4 ile hiçbir koşulda tepkime vermiyor. Y, HCl ile tepkime vermiyor, H_2SO_4 ile SO_2 oluşturuyor. Z, HCl ve H_2SO_4 ile H_2 oluşturuyor. X, Y,Z metalleri için aşağıdakilerden hangisi doğrudur?

(a) X metali Au, Y metali Cu, Z metali Mg'dir.

b) X metali Cu, Y metali Au, Z metali Mg'dir.

c) X metali Mg, Y metali Cu, Z metali Au'dur.

d) X metali Au, Y metali Cu, Z metali Ag'dir.

e) X metali Au, Y metali Mg, Z metali Cu'dur.

26. 2,7 gr. Al'u tepkimeye sokmak için ağırlıkça % 60'lık NaOH çözeltisinden kaç gram kullanılmalıdır?

a) 20/3

(b) 20

c) 40/3

d) 12

e) 10

27. $HBrO_3+SO_2+H_2O \longrightarrow Br_2+H_2SO_4$ denklemi en küçük tamsayılarla eşitlendiğinde H_2O'nun katsayısı ne olur?

a) 1

b) 2

c) 3

(d) 4

e) 5

28. $^{230}_{90}Th$ izotopu bir dizi zincir radyoaktif bozunma sırasında toplam 4α, 2β, 1γ taneciği fırlatmıştır. Bozunma sonunda hangi X elementi oluşur?

a) $^{210}_{78}X$

b) $^{218}_{86}X$

c) $^{214}_{82}X$

(d) $^{214}_{84}X$

e) $^{206}_{82}X$

29. 10 gr. sirke çözeltisini nötralleştirmek için 400 cm^3 0,1 M.KOH çözeltisi kullanılıyor. Sirke çözeltisi ağırlıkça % kaçlıktır?(NaOH: 40 CH_3COO: 60)

a) 3

b) 2,4

c) 1,2

(d) 24

e) 48

30. Aşağıdaki olaylardan hangisi yerdeğiştirme olayıdır?

a) Izopropil alkolden aseton oluşumu

b) Asetaldehitten asetik asit oluşumu

c) Etilenden, etan oluşumu

(d) Propandan, propil klorür oluşumu

e) Etunolden, etil asetat oluşumu

31. 32 gr. O_2 gazının 10 lt. hacim kapladığı koşullarda 32 gr. SO_2 gazının hacmi kaç litredir? (O: 16 S: 32)

a) 10

(b) 5

c) 15

d) 20

e) 7,5

32. C, H, O oluşan organik bileşiğin 0,4 molu, 1 mol O_2 ile yandığında 1,6 mol CO_2 ve 1,2 mol H_2O oluşuyor. Bu bileşiğin formülü nedir?

a) $C_3H_6O_3$

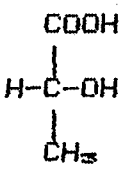
b) $C_2H_4O_2$

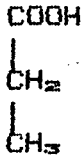
c) CH_2O

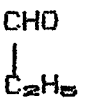
d) C_2H_6O

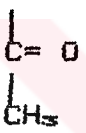
(e) $C_4H_6O_6$

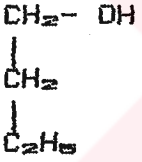
33. Aşağıdaki hangi organik madde optikçe aktiftir?

(a) 

b) 

c) 

d) 

e) 

34. $C_7H_{15}-OH + O_2 \longrightarrow CO_2 + H_2O$ tepkimesinde O_2 katsayısı nedir?

a) 11/2
b) 11
c) 22
(d) 21/2
e) 21

35. $C_5H_{11} - COO - CH_3$ organik bileşiğinin sabunlaşmasından hangi bileşik çifti elde edilir?

a) $C_5H_{11} - OH + CH_3 - OH$

b) $CH_3 - COOH + C_5H_{11} - OH$

(c) $C_5H_{11} - COOH + CH_3OH$

d) $CH_3COOH + C_5H_{11}COOH$

e) $C_6H_{13} - OH + CH_4$

36. (-2) yüklü bir iyon için hangisi her zaman doğrudur? (n= nötron, p= proton, e= elektron)

a) n= p+2

b) p= c+2

c) e= n-2

d) n= p-2

(e) e= p+2

37. 10lt. N_2 ve 15 lt. H_2 gazından kaç lt NH_3 gazı oluşur?

a) 30
b) 15
c) 5
(d) 10
e) 20

38. Aşağıdaki bileşiklerden hangisi fehlink ayıracına etki eder?

a) $CH_3 - CO - CH_3$

(b) C_3H_7CHO

c) $CH_3 - COO - CH_3$

d) $C_6H_{11}-OH$

e) $C_8H_{17} - COOH$

39. Memeli hayvanlarin küçük kan dolaşımında, kan aşağıdaki yollardan hangisini izler?

a) Sağ karıncık, sol kulakçık, akciğer, akciğer atardamarı, akciğer toplar damarı.

(b) Sağ karıncık, akciğer atardamarı, akciğer, akciğer toplar damarı, sol kulakçık.

c) Akciğer atardamarı, akciğer, sol kulakçık, akciğer toplar damarı, sağ karıncık.

d) Sağ karıncık, sol kulakçık, akciğer atardamarı, akciğer, akciğer toplar damarı.

e) Sol kulakçık, sağ karıncık, akciğer atardamarı, akciğer, akciğer toplar damarı.

40. Keseli kurtları insanda, ergin hali köpekte bulunan tenya hangisidir?

a) Tenya saginata

b) Tenya solium

(c) Tenya ekinokokûs

d) Tenya dibotriyosefalus

e) Ankilostem

41. Bir deneme sonucunda 317 tane düzgün, 102 tane de buruşuk bezelyeler elde ediliyor. Acaba bu bezelyeleri veren anne ve babanin genetipleri hangisidir?

a) DD x DD

b) Dd x DD

c) dd x DD

(d) Dd x Dd

e) dd x dd

42. Aşağıdakilerden hangisi yapıca en basit ve en küçüktür?

(a) Virus

b) Basil

c) Vibriyon

d) Öglena

e) Koküs

43. Ürogenital sistemle ilgili aşağıdaki özelliklerden hangisi sürüngenlerle ileri memelilerin ortak bir özelliği değildir?

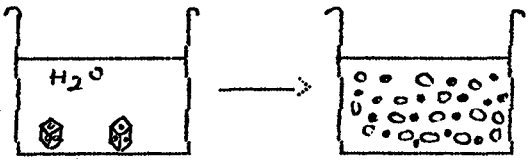
a) Müller kanalının varlığı

b) Wolf kanalının bulunması

c) Metanefroz böbreğin varlığı

d) Wolf kanalının testislere açılması

(e) Sidik kanalının dışkılığa açılması

44. 

O Tuz ● Seker

Yanda cereyan eden olayı en doğru nasıl açıklarsınız?

a) Şekerin suda difüzyonu

b) Tuzun suda difüzyonu

c) Suda tuz ve şekerin aktif taşınması

(d) Suda tuz ve şekerin yayınması

e) Tuz ve şekerin suya geçişmesi

45. AB ♀ ♂ BO

Çaprazlaması neticesinde O kan grubu ihtimali % kaçtır?

a) % 50

b) % 25

c) % 75

d) 100

(e) Hicbiri

46. Populasyon büyümesi kontrol edilemeyen bir durum için aşağıdakilerden hangisi geçerli olur?

a) Besin miktarında artiş görülür.

b) Populasyon dengede kalır.

c) Yavru bakımında ihmal edilir.

d) Doğum oranında düşme görülür.

(e) Populasyon geometrik oranda artar.

47. Fotosentezin karbon devrinde 12 molekül karbondioksit kullanılarak iki mol glikoz üretilebilmesi için kaç molekül ATP ve kaç molekül $NADPH_2$ kullanılır?

(a) 36 mol ATP, 24 mol $NADPH_2$

b) 48 mol ATP, 24 mol $NADPH_2$

c) 12 mol ATP, 12 mol $NADPH_2$

d) 24 mol ATP, 24 mol $NADPH_2$

e) 24 mol ATP, 12 mol $NADPH_2$

48. Aşağıdakilerden hangisi kalburlu boruların özelliklerinden değildir?

a) Canlı hücrelidir.

b) Arkadaş hücreleri vardır.

(c) Trakeid ve trakeden oluşmuştur.

d) Çeper ince selülozdur.

e) Çeperde Ligninleşme yoktur.

APPENDIX B

This section gives the detailed tables of the Newman-Keuls findings for each dependent variable of the study. These dependent variables include the scores on the Mathematics, Physics and Chemistry Pre-tests, their parallel forms and summative test scores on these three subject areas. Scores on the Mathematics and Science Tests similar to those given on the Student Placement Examination (ÖYS, 1986), scores on the test given by the Association of Private University Preparatory Institutions (Özdebir, 1987), Student Selection Examination (ÖSS, 1987) and Student Placement Examination (ÖYS, 1987) scores are the other dependent variables of the present research.

TABLE 48. Comparison of the Mathematics Pre-test Scores of the four groups, using the Newman-Keuls formula.

	DF	MS Error	Calculated q	Significance Level
ML+UPI and ML	126	7.884	3.47	$q_{r\alpha} < .05$ 3 steps apart at .05=3.36
UPI and ML+UPI	126	7.884	0.79	N.S.
ML+UPI and Control	126	7.884	1.94	N.S.
UPI and ML	126	7.884	4.26	$q_{r\alpha} < .05$ 4 steps apart at .05=3.69
Control and ML	126	7.884	1.53	N.S.
UPI and Control	126	7.884	2.39	N.S.

TABLE 49. Comparison of the Physics Pre-test Scores of the four groups, using Newman-Keuls formula.

	DF	MS Error	Calculated q	Significance Level
ML+UPI and ML	129	6.852	5.49	$q_{r\alpha} < .01$ 3 steps apart at .01=4.20
ML+UPI and UPI	129	6.852	0.93	N.S.
ML+UPI and Control	129	6.852	8.34	$q_{r\alpha} < .01$ 4 steps apart at .01=4.50
UPI and ML	129	6.852	4.56	$qr_{\alpha} < .01$ 2 steps apart at .01=3.70
ML and Control	129	6.852	2.85	N.S.
UPI and Control	129	6.852	7.41	$q_{r\alpha} < .01$ 3 steps apart at .01=4.20

TABLE 50. Comparison of the Chemistry Pre-test Scores of the four groups, using Newman-Keuls formula.

	DF	MS Error	Calculated q	Significance Level
ML+UPI and ML	130	11.027	5.37	$q_{r\alpha} < .05$ 3 steps apart at .05=3.36
ML+UPI and UPI	130	11.027	3.95	$q_{r\alpha} < .01$ 2 steps apart at .01=3.70
ML+UPI and Control	130	11.027	5.70	$q_{r\alpha} < .01$ 4 steps apart at .01=4.50
UPI and ML	130	11.027	1.41	N.S.
ML and Control	130	11.027	0.34	N.S.
UPI and Control	130	11.027	1.75	N.S.

TABLE 51. Comparison of the Parallel Form of the Mathematics Pre-test Scores of the four groups, using Newman-Keuls formula.

	DF	MS Error	Calculated q	Significance Level
ML+UPI and ML	131	12.937	1.42	N.S.
ML+UPI and UPI	131	12.937	5.69	$q_{r\alpha} < .01$ 3 steps apart at .01=4.20
ML+UPI and Control	131	12.937	8.60	$q_{r\alpha} < .01$ 4 steps apart at .01=4.50
ML and UPI	131	12.937	4.26	$q_{r\alpha} < .01$ 2 steps apart at .01=3.70
ML and Control	131	12.937	4.59	$q_{r\alpha} < .01$ 3 steps apart at .01=4.20
UPI and Control	131	12.937	2.92	$q_{r\alpha} < .05$ 2 steps apart at .05=2.80

TABLE 52. Comparison of the Parallel Form of the Physics Pre-tests of the four groups, using Newman-Keuls formula.

	DF	MS Error	Calculated q	Significance Level
ML+UPI and ML	128	6.884	3.42	$q_{r\alpha} < .05$ 2 steps apart at .05=2.80
ML+UPI and UPI	128	6.884	6.95	$q_{r\alpha} < .01$ 3 steps apart at .01=4.20
ML+UPI and Control	128	6.884	13.98	$q_{r\alpha} < .01$ 4 steps apart at .01=4.50
ML and UPI	128	6.884	3.52	$q_{r\alpha} < .05$ 2 steps apart at .05=2.80
ML and Control	128	6.884	10.56	$q_{r\alpha} < .01$ 3 steps apart at .01=4.20
UPI and Control	128	6.884	7.03	$q_{r\alpha} < .01$ 2 steps apart at .01=3.70

TABLE 53. Comparison of the Parallel Form of the Chemistry Pre-tests of the four groups, using Newman-Keuls formula.

	DF	MS Error	Calculated q	Significance Level
ML+UPI and ML	125	11.116	1.57	N.S.
ML+UPI and UPI	125	11.116	5.49	$q_{r\alpha}$ < .01 3 steps apart at .01=4.20
ML+UPI and Control	125	11.116	7.38	$q_{r\alpha}$ < .01 4 steps apart at .01=4.50
ML and UPI	125	11.116	3.93	$q_{r\alpha}$ < .01 2 steps apart at .01=3.70
ML and Control	125	11.116	5.81	$q_{r\alpha}$ < .01 3 steps apart at .01=420
UPI and Control	125	11.116	1.88	N.S.

TABLE 54. Comparison of the Mathematics Summative Test Scores of the four groups, using Newman-Keuls formula.

	DF	MS Error	Calculated q	Significance Level
ML+UPI and ML	132	275.267	1.03	N.S.
ML+UPI and UPI	132	275.267	1.59	N.S.
ML+UPI and Control	132	275.267	4.94	$q_{r,\alpha} < .01$ 4 steps apart at .01=4.50
ML and UPI	132	275.267	0.11	N.S.
ML and Control	132	275.267	3.91	$q_{r,\alpha} < .05$ 3 steps apart at .05=3.36
UPI and Control	132	275.267	3.34	$q_{r,\alpha} < .05$ 2 steps apart at .05=2.80

TABLE 55. Comparison of the Physics Summative Test Scores of the four groups, using Newman-Keuls formula.

	DF	MS Error	Calculated q	Significance Level
ML+UPI and ML	132	135.346	0.41	N.S.
ML+UPI and UPI	132	135.346	1.16	N.S.
ML+UPI and Control	132	135.346	2.02	N.S.
ML and UPI	132	135.346	1.02	N.S.
ML and Control	132	135.346	1.88	N.S.
UPI and Control	132	135.346	0.86	N.S.

TABLE 56. Comparison of the Chemistry Summative Test Scores of the four groups, using the Newman-Keuls formula.

	DF	MS Error	Calculated q	Significance Level
ML+UPI and ML	132	157.616	1.14	N.S.
ML+UPI and UPI	132	157.616	1.33	N.S.
ML+UPI and Control	132	157.616	3.94	$q_{r\alpha} < .05$ 4 steps apart at .05=3.69
ML and UPI	132	157.616	0.19	N.S.
ML and Control	132	157.616	3.02	$q_{r\alpha} < .05$ 3 steps apart approaches significance at .05=3.36
UPI and Control	132	157.616	2.61	$q_{r\alpha} < .05$ 2 steps apart approaches significance at .05=2.80

TABLE 57. Comparison of the Scores of the Mathematics Test similar to the one given on DYS (1986) of the four groups, using Newman-Keuls formula.

	DF	MS Error	Calculated q	Significance Level
ML+UPI and ML	132	21.080	3.41	$q_{r\alpha} < .05$ 3 steps apart at .05=3.36
ML+UPI and UPI	132	21.080	0.02	N.S.
ML+UPI and Control	132	21.080	4.15	$q_{r\alpha} < .05$ 4 steps apart at .05=3.69
ML and UPI	132	21.080	0.09	N.S.
ML and Control	132	21.080	0.73	N.S.
UPI and Control	132	21.080	3.60	$q_{r\alpha} < .05$ 3 steps apart at .05=3.36

TABLE 58. Comparison of the Scores of the Science Test similar to the one given on OYS (1986) of the four groups, using Newman-Keuls formula.

	DF	MS Error	Calculated q	Significance Level
ML+UPI and ML	132	38.376	3.99	$q_{r\alpha} < .05$ 3 steps apart at .05=3.36
ML+UPI and UPI	132	38.376	1.02	N.S.
ML+UPI and Control	132	38.376	4.23	$q_{r\alpha} < .05$ 4 steps apart at .05=3.69
ML and UPI	132	38.376	2.96	$q_{r\alpha} < .05$ 2 steps apart at .05=2.80
ML and Control	132	38.376	0.24	N.S.
UPI and Control	132	38.376	3.20	$q_{r\alpha} < .05$ 3 steps apart approaches significance at .05=3.31

TABLE 59. Comparison of the Scores of the Test given by the Association of Private University Preparatory Institutions (Ozdebir, 1987) of the four groups, using Newman-Keuls formula.

	DF	MS Error	Calculated q	Significance Level
ML+UPI and ML	57	666.325	1.35	N.S.
ML+UPI and UPI	57	666.325	0.44	N.S.
ML+UPI and Control	57	666.325	1.98	N.S.
ML and UPI	57	666.325	1.78	N.S.
ML and Control	57	666.325	0.63	N.S.
UPI and Control	57	666.325	2.41	N.S.

TABLE 60. Comparison of the Student Selection Examination (BSS, 1987) Scores of the four groups, using Newman-Keuls formula.

	DF	MS Error	Calculated q	Significance Level
ML+UPI and ML	131	308.572	4.84	$q_{r\alpha} < .01$ 3 steps apart at .01=4.20
ML+UPI and UPI	131	308.572	0.69	N.S.
ML+UPI and Control	131	308.572	4.52	$q_{r\alpha} < .01$ 2 steps apart at .01=3.70
ML and UPI	131	308.572	5.53	$q_{r\alpha} < .01$ 4 steps apart at .01=4.50
ML and Control	131	308.572	0.19	N.S.
UPI and Control	131	308.572	5.20	$q_{r\alpha} < .01$ 3 steps apart at .01=4.20

TABLE 61. Comparison of the Science Scores on the Student Placement Examination (OYS-Fen, 1987) of three groups, using Newman-Keuls formula.

	DF	MS Error	Calculated q	Significance Level
ML+UPI and UPI	27	5546.382	0.84	N.S.
ML+UPI and Control	27	5546.382	7.28	$q_{r\alpha} < .01$ 2 steps apart at .01=3.89
UPI and Control	27	5546.382	8.13	$q_{r\alpha} < .01$ 3 steps apart at .01=4.45

TABLE 62. Comparison of the Mathematics Scores on the Student Placement Examination (OYS-Mat, 1987) of the four groups, using Newman-Keuls formula.

	DF	MS Error	Calculated q	Significance Level
ML+UPI and ML	59	4050.473	3.82	$q_{r\alpha} < .05$ 3 steps apart at .05=3.40
ML+UPI and UPI	59	4050.473	0.29	N.S.
ML+UPI and Control	59	4050.473	2.93	$q_{r\alpha} < .05$ 2 steps apart at .05=2.83
ML and UPI	59	4050.473	4.10	$q_{r\alpha} < .05$ 4 steps apart at .05=3.98
ML and Control	59	4050.473	0.89	N.S.
UPI and Control	59	4050.473	3.22	$q_{r\alpha} < .05$ 3 steps apart approaches significance at .05=3.36

TABLE 63. Comparison of the Combined Turkish and Mathematics Scores on the Student Placement Examination (OYS-T-M, 1987) of the four groups, using Newman-Keuls formula.

	DF	MS Error	Calculated q	Significance Level
ML+UPI and ML	51	4163.261	1.11	N.S.
ML+UPI and UPI	51	4163.261	0.04	N.S.
ML+UPI and Control	51	4163.261	3.85	$q_{r\alpha}$ < .05 4 steps apart at .05=3.74
ML and UPI	51	4163.261	1.07	N.S.
ML and Control	51	4163.261	2.74	N.S.
UPI and Control	51	4163.261	3.31	$q_{r\alpha}$ < .05 3 steps apart at .05=3.40

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