**JABRIYA INDIAN SCHOOL**

**KUWAIT**

 **I PreBoard Examination**

 **SET II
SUBJECT – Mathematics Max Marks:100
Class – XII Duration:3 Hrs**

**General Instructions**

1. All questions are compulsory
2. The question paper consists of **29** questions divided into three sections A,B and C. Section A comprises of **10** questions of one mark each, Section B comprises of **12** questions of **4** marks each and Section C comprises of **7** questions of **6** marks each.
3. All questions in Section A are to be answered in one word, one sentence or as per the exact requirements of the questions.
4. There is no overall choice. However, internal choices has been provided in **4** questions of **4** marks and **2** questions of **6** marks. You have to attempt only one of the alternatives in all such questions.
5. Use o f calculators is not permitted

**SECTION A**

1. Write a square matrix of order 2 which is both symmetric & skew symmetric.

2. Give an example to show that the relation R in the set of natural numbers, defined by is not transitive.

3 .Write the principal value of

4. A square matrix A, of order 3 has Find

5.If and and , find the value of .

6. For what value of p, is is a unit vector?

7.Evaluate

8. If find f(x).

 9. Write the Cartesian equation of the following line given in vector form:

10. From the following matrix equation

***SECTION B***

11. Let be a function defined as

 Show that where S is the range of f is invertible. Find the inverse of f.

Or

Let and be a binary operation on A defined by

 .Show that \* is commutative, associative. Also find identity element for \* on A ,if any.

12 . Prove that:

13.

Or

By using elementary operations , find the inverse of the matrix

14 If the function is continuous at x =1 ,find the values of a and b .

15.If x for -1<x<1, show that 

16. **.** Evaluate 

Or

 Evaluate

17. Evaluate the integral 

18. . Find the particular solution of the following differential equation satisfying the given condition:

 Or

 Solve the following differential equation:

19. Form the differential equation of the family of circles touching the x-axis at origin.

20.If =+4+2=3-2+7,=2-+4 Find a vector  which is perpendicular to  and  and =15

21.Find the equation of the plane containing the line  =  =  and perpendicular to the plane x + 2y + z – 12 = 0.

22.From a well shuffled pack of 52 cards, 3 cards are drawn one-by-one with replacement. Find the probability distribution of number of queens.

**SECTION C**

23.A firm is engaged in breeding goats. The goats are fed on various products grown on the farm. They need certain nutrients, named as X, Y and Z. The goats are fed on two products A and B .One unit of product A contain 36 units of X, 3 units of Y and 20 units of Z , while one unit of products B contain 6 units of X , 12 units of Y and 10 units of Z . The minimum requirement of X,Y and Z is 108 units , 36 units and 100 units ,respectively . Product A costs Rs. 20 per unit and product B costs Rs. 40 per unit. How many units of each product must be taken to minimize the cost?

**24.** A card from a pack of 52 cards is lost. From the remaining cards of the pack, two cards are drawn and are found to be both diamonds. Find the probability of the lost card being a diamond.

 Or

A laboratory blood test is 99% effective in detecting a certain disease when it is in fact, present. However, the test also yields a false positive result for 0.5% of the healthy person tested(i.e. if a healthy person is tested, then, with probability 0.005, the test will imply he has the disease). If 0.1 percent of the population actually has the disease, what is the probability that a person has the disease given that his test result is positive?

25.Find the equation of the plane passing through the point(-1,-1,2) and perpendicular to the planes 3x+2y-3z=1 and 5x-4y+z=5.

26. Using matrices , solve the following system of equations:

3x-2y+3z=-1

2x+y-z=6

4x-3y+2z=5

27. . Using integration, find the area of the region bounded by the lines,

 4x-y+5=0; x+y-5=0 and x-4y+5=0

 Or

Using integration, find the area of the following region:

28. . The lengths of the sides of an isosceles triangle are units. Calculate the area of the triangle in terms of x and find the value of x which makes the area maximum.

29.Find the general solution and the particular solution of the differential equation 

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