**JABRIYA INDIAN SCHOOL**

**KUWAIT**

**I PreBoard Examination**

**SET I   
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 of calculators is not permitted

**SECTION A**

1. Find the principal value of
2. Find the number of binary operations on the set {a,b}.
3. If
4. *Write the Cartesian form of equation of the line whose vector equation*

*is*

1. Find a unit vector in the direction of
2. Find the angle between 2 vectors and. if
3. Give an example of two non zero matrices whose product is a zero matrix.
4. Find x if
5. Evaluate
6. Evaluate

***SECTION B***

1. Prove the following, using properties of determinants:

Or

Find the inverse of the following matrix, using elementary transformations:

12. Form the differential equation of the family of circles in the second quadrant and touching the coordinate axes.

13. .Evaluate

Or

Evaluate

14 Differentiate the following function with respect to x:

15. let , and . Find a vector which is perpendicular to both and and

16 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 commutative and associative also find the identity element for on A, if any.

17. Evaluate as limit of sum.

18. Prove the following:

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

Or

Solve the following differential equation:

**20.** If then show that

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 = find AB .Hence solve the system of equations .

x – y = 3, 2x + 3y + 4z = 17, y + 2z = 7

24. Evaluate the following:

25. A factory makes two types of items A and B, made of plywood. One piece of item A requires 5 minutes for cutting and 10 minutes for assembling. One piece of item B requires 8 minutes for cutting 8 minutes for assembling. there are 3 hours and 20 minutes available for cutting and 4 hours for assembling. The profit on one piece of item A is Rs. 5 and that on item B is Rs. 6. How many pieces of each type should the factory make so as to maximize profit ? Make it as an L.P.P. and solve it graphically.

26. 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?

27. 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.

28. 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:

29 . Find the coordinates of the point where the line through (3,-4,-5) and (2,-3,1) crosses the plane determined by points A(1,2,3), B(2,2,1) and

C(-1,3,6).

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