**Sample Paper- 2013
Sub: Mathematics**

**Class-XII**

**Duration: 2.5 Hour Max. Mark 100.**

***General Instructions:***

*1.All questions are compulsory.*

*2. The question paper consist 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 four marks each and section C comprises of 7 questions of six marks each.*

*3. All questions in Section A are to be answered in one word, one sentence or as per the exact requirement of the question.*

*4. There is no overall choice. However, internal choice has been provided in 4 questions of four marks each and 2 questions of six mark each. You have to attempt only one of the alternatives in all such questions.*

*5. Use of calculators is not permitted. You may ask for logarithmic tables, if required.*

**Section-A**

1. Find the intersection point of the lines and ,if they intersect.
2. Differentiate w.r.t. ‘*x*’.
3. Let the function  is defined as 
4. Find the trace of the matrix.
5. 
6. For what value of *k* the matrix has no inverse.
7. Find the projection of .

1. Evaluate 
2. Evaluate 
3. Under what condition three vectors  are coplanar?

**Section-B**

1. Find the value of λ for which these three vectors represented by points (-1, 4, -3) ,(3, λ, -5) , (-3, 8, -5) and (-3, 2, 1) are coplanar.

OR

The scalar product of the vector *i*ˆ + ˆ*j* + *k*ˆ with a unit vector along the sum ofvectors 2*i*ˆ + 4 ˆ*j* −5*k*ˆ and λ*i*ˆ+ 2 ˆ*j* + 3*k*ˆ is equal to one. Find the value of λ.

1. Prove thatby using properties of determinants only.
2. Consider a binary operation Show that.
3. 
4. Check the continuity of the function *Continuous efforts for betterment enhances the performance towards perfection. Comment on it.*
5. Solve .
6. Solve the following differential equation:.
7. Find the interval for the function  is increasing or decreasing.

**OR**

Prove that the curvesand are orthogonal to each other, given that. .

OR

Differentiate .

1. *Evaluate*

OR



1. Find the shortest distance between the lines and 
2. Let *E* and *F* be two independent events. The probability that exactly one of them occurs is and the probability of none of them occurring is . If P (T) denotes the probability of the occurrence of the event T, then find the value of P(E) and P(F).

**Section-C**

1. Let U1 and U2 are two urns such that U1 contains 3 white and 2 red balls, and U2 contains only 1 white ball. A fair coin is tossed. If head appears then one ball is drawn from at random from U1 and put into U2 .However, If tail appears then two balls are drawn at random from U1 and put into U2. Given that the drawn ball from U2 is white, then find the probability that the head appeared on the coin.
2. Find the equation of the plane containing the line  and perpendicular to the plane containing the straight linesand .

**OR**

 Find the equation of the plane passing through the intersection of the plane parallel to the line with direction ratio <2, 1, 1>. Find also the perpendicular distance of (1, 1, 1) from the plane.

1. Let the straight line divides the area enclosed by into two parts R1

and R2 suchsq. units. Find the value of *b*.

1. Evaluate: . *Differentiate the wastage of seconds; integrate the number of hours in a day. Comment on it.*

OR



*Differentiate the wastage of seconds; integrate the number of hours in a day. Comment on it.*

1. A line is passing through (8, 1). Prove that area of the triangle formed by the intercepts and the line is minimum, When sum of their perpendicular sides is units.
2. Using matrices solve the following system of equations:



*Mr X, indulging himself for fake praise by leaking the question paper to his private students, few student have decided to left the tuitions from that teacher, what kind of character they are reflecting? Comment on it.*

1. There are two factories located one a place P and the other at place Q. From these locations, a certain commodity is to be delivered to each of the three depots situated at A, B and C. The weekly requirement of the depots are respectively 5, 5 and 4 units of the commodity while the production capacity of the factories at P and Q are respectively 8 and 6 units. The cost of transportation per unit is given below:

|  |  |  |  |
| --- | --- | --- | --- |
|  **To****From** | A | B | C |
| P | 160 | 100 | 150 |
| Q | 100 | 120 | 100 |

How many units should be transported from each factory to each depot in order that the transportation cost is minimum? What will be the minimum transportation cost?



**AIMS-I-2013/4**

***Pre-Board Test Series- I*By: SandeepShishodia**