**Sample Paper- 2013
MATHEMATICS**

 **Class-XII**

## Time : 3 hours M.M. 100

## General Instructions:

## (1). All questions are compulsory

## (2). The question paper consists of 29 questions divided into three 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 07 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 in 04 questions of six marks each. You have to attempt only one of the alternative in all such questions.

## (5). Use of calculator is not permitted. However, you may ask for logarithmic and statistical Tables, if required.

# Section – A

Q. 1 A matrix A of order 3× 3 has determinant 5. What is the value of ?

Q. 2 For what value of x, the following matrix is singular ?

Q. 3 Evaluate the determinants.

Q. 4 What is the principal value of

 ?

 Q.5 Give an example of a relation which is reflexive and transitive but not

 Symmetric;

Q.6 The radius of a circle is increasing at the rate of 0.7 cm/s. what is the rate

 of increasing of its circumference ?

Q.7 .

Q.8 Find the projection of the vector = , on the vector

 = .

Q.9 Find if for a unit vector ,

Q.10 Show that the points (2,3,4), (-1,-2,1),(5,8,7) are collinear.

**SECTION – B**

Q.11 Write the function in the simplest form , x

Q12 Show that the function f(x) = is the continuous at every x

 but fails to be differentiable at x = -2.

 P.T.O.

Q.13 Using properties of determinants, prove that





Q.16 Find the equation of the tangent line to the curve y = x2 - 2x+7 is parallel to the line

 2x - y + 9 = 0 .

Q 17 Evaluate

OR

 

Q.18 Evaluate .

OR

 

Q.19 Evaluate as the limit of the sum.

Q.20 Find the area of the parallelogram whose adjacent sides are represented

 by the vectors and .

 Q.21 Find the shortest distance between the lines, whose equations are

OR

 Prove that the image of the point (3,-2,1) in the plane 3x – y + 4z = 2

 lies on the plane, x + y + z + 4=0 .

Q .22 There are 5% defective items in a large bulk of items. What is the Probability that a

 sample of 10 items will include not more than one defective items ?

 P.T.O.

**SECTION - C**

 23 

OR

 Consider f : R given by f(x) = 9x2+6x-5. Show that f is Invertible.

 Find the inverse of f.

Q.24 A point on the hypotenuse of a triangle is at distance *a* and *b* from the Sides of the

 triangle.

 Show that the minimum length of the hypotenuse is

Q.25 Find the area of the region bounded by the curve y = x2+2, and the lines y =x, x = 0

 and x = 3.

Q.26 Solve the differential equation

 (tan-1y - x)dy = (1 + y2) dx.

Q.27 Find the vector equation of the line passing through the (1,2,3) and parallel to the

 planes = 5 and = 6.

OR

 

Q.28 Two godowns A and B have grain capacity of 100 quintals and 50 quintals

 respectively.They supply to 3 ration shops, D,E and F whose requirements

 Are 60,50 and 40 quintals respectively. The cost of Transportation per

 quintal from the godowns to the shops are given in the following table ;

 

 How should the supplies be transported in order that the Transportation cost

 is minimum ? what is the minimum cost?

Q.29 A factory has two machines A and B. past record shows that machine A produced 60%

 of the items of output and machine B produced 40% Of the items. Further, 2% of the

 items produced by the machine A and 1% produced by the machine B were defective.

 All the items are put into One stockpile and then one item is chosen at random from

 this and is Found to be defective. What is the probability that it was produced by

 machine B?

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