## **Sample Paper – 2013 Class – XI Subject –MATHEMATICS**

## **M.M. 100 Time : 3 hours**

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## **General Instructions:**

## ***(i).All questions are compulsory***

## ***(ii).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.***

***(iii).All questions in section A are to be answered in one word, one sentence or as per the exact***

***requirement of the question.***

## ***(iv) There is no overall choice. However Internal choice has been in 04 questions of four marks each***

## ***and 02 questions of six marks each .You have to attempt only one of the alternative in all such***

***questions.***

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

***required.***

# Section – A

Q.01 Find the domain and range of

, from R to R.

Q.02 Simplify

Q.03 How many three digit number are there with no digit repeated?

Q.04 Expand

Q.05 Find the vertex, focus directrix, latus rectum and axis of the parabola

3y2 = 20x

Q.06 Prove that

Q.07 Differentiate the following function w.r.t. x;

Q.08 Are the following pair of statements negation of each other?

The number x is not a rational number

The number x is not an irrational number

***P.T.O.***

Q.09 State whether the following statement is “exclusive” or “inclusive”

A card drawn from of a pack of cards is either black or king.

Q.10 Write the converse, contradiction and contrapositive of each of the statements given

below : If a quad. ABCD is a square, then all of its sides are equal.

# Section – B

Q.11 Let A and B be sets if for some set X, prove

that A = B

Q.12 Prove by mathematical induction that n(n + 1)(2n + 1) is a multiple of 6 for all

Q.13 Express the following complex number in polar for

OR

For any two sets A and B. prove that

Q.14.The mean and variance of 8 observations are 9 and 9.25 respectively if six of the

Observations are 6 ,7, 10, 12 , 12 and 13, find the remaining two observations .

Q.15 A manufacturer has 600 litres of a 12% solution of acid. How many litres of a 30% acid but

solution must be added to it so that acid content is the resulting mixture will be more than

15% less than 18%.

Q.16 Find the length of medians of the triangle a (0, 0, 6), B(0, 4, 0) and C(6, 0, 0).

OR

Let a and b be arbitrary real numbers. Using the Principle of mathematical induction,

prove that

Q.17 If 4- digit number greater than 5000 are randomly formed from the digits 0, 1, 3, 5, and

7, what is the probability of forming a number divisible by 5, when

(i) the digits may be repeated;

(ii) the repetition of digits is not allowed.   
 ***P.T.O.***

Q.18 Gaurav buys a scooter Rs 22000, He pay Rs 4000 case and agrees to pay the balance in

annual installments of Rs 1000 plus 10% interest on the unpaid amount. What will the

scooter cost him?

Q.19 Find the value of *a*, if the foci of the ellipse and hyperbola

coincides.

OR

Represent the complex number in the polar form.

Q.20 Two consecutive sides of a parallelogram are 4x + 5y = 0 and 7x + 2y = 0. If the equation

to one diagonal is 11x + 7y = 9. Find the equation of the other diagonal .

Q.21 In a single throw of three dice, find the probability of getting a total of 17 or 18.

Q.22 Evaluate

OR

Find the derivative of from first principle.

# Section – C

Q.23 In a survey of 25 students, it was found that 15 had taken mathematics, 12 had taken

physics and 11 had taken chemistry, 5 had taken mathematics and chemistry, 9 had

taken mathematics and physics, 4 had taken physics and chemistry and 3 had taken

all the three subjects. Find the number of students that had

(i)Only chemistry; (ii) only mathematics; (iii) only physics;

(iv) physics and chemistry but not chemistry;

(v) mathematics and physics but not chemistry;

(vi) only one of the subjects; (vii) at least one of the three subjects;

(viii) none of the subject

Q.24 Let A = {9,10,11,12,13} and be defined by *f*(n) = highest prime factor

of *n.* find the range of  *.*

OR

Differentiate from ab initio method

***P.T.O.***

Q.25 Prove that

Q.26 A railway engine is moving along a circular railway track of radius 1500 metres with

Speed of 66 km/hour. Find the angle turned by the engine in 10 second.

Q.27 The coefficients of three consecutive terms in the expansion of (1 + *a*)n are in the ratio

1 : 7 : 42. Find n.

Q.28 Find the sum of all two – digit numbers which when divided by 4, yields 1 as remainder.

OR

Evaluate

Q.29 There are 10 persons including 3 ladies. How many committees of 5 persons can be

Formed so as to include at least one lady in each committee?