## **Sample Paper – 2013Class – XISubject –MATHEMATICS**

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

## **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 Determine the domain and range of the following relations.

 $R= \left\{\left(x, x^{3}\right):x is a prime less then 10\right\}$

Q.02 Compute : $\sqrt{\frac{-49}{25}}.\sqrt{\frac{-1}{9}}$ .

Q.03 find n if 2n-1Pn : 2n+1Pn-1 = 22 : 7

Q.04 Expand $\left(\frac{3}{4}x^{2}-\frac{1}{2}y\right)^{4}$.

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

 x2 = - 8y

Q.06 if $\lim\_{x\to -a}\frac{x^{9} + a^{9}}{x + a}=9$ . find all possible value of *a.*

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

 $x^{4}+2x^{^{1}/\_{4 }}+\frac{2}{\sqrt[3]{x}}+5$

Q.08 Are the following pair of statement negation of

 The number x is not a rational number

 The number x is not an irrational number.

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

Q.09 Identify the quantifier in the following statements and write the negation of the

 Statements;

 There exist a quadrilateral which has each side.

Q.10 write the statements in the form “ if p then q“

 You can access the website if you pay a subscription fee.

# Section – B

Q.11 A college awarded 38 medals 38 medals in football, 15v in basketball and 20 to cricket. If

 these medals went to a toal of 58 men and only three in all the three sports, how many

 received medals in exactly two of the three sports?

Q.12 Show that the ratio of the sum of first n terms of a GP to the sum of terms from (n+1)th to

 (2n)th term is $\frac{1}{r^{n}}$ .

Q.13 A solution of 8% boric acid is to be diluted by adding a 2% boric acid solution to it. The

 resulting mixture is to be more than 4% but less than 6% boric acid. If we have 640 liters

 of the 8% solution, how many liters of the 25 solution will have to be added?

OR

 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.

 Q.14 Find the length of the perpendiculars from the point (4, -7) to the line joining the

 origin and the point of intersection of the lines 2x – 3y + 14 = 0 and 5x + 4y – 7 = 0.

Q.15 A(3, 2, 0), B(5, 3, 2), C(-9, 6, -3) are three pointes forming a triangle. AD, the bisector of

 angle BAC meets BC in D. Find the co-ordinates of D.

OR

 The mean and S.D. of 100 observations were calculated as 40 and 5.1 respectively by a

 student who took by mistake 50 instead of 40 for one observation. What are the correct

 mean and S.D.

Q.16 The mean and variance of 7 observations are 8 and 16 respectively. If 5 of the observations

 are 2, 4, 10, 12, 14, find the remaining two observations.

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

Q.17 Find $\lim\_{x\to 1}\frac{\sqrt{x^{2} + 8 }- \sqrt{10 - x^{2}}}{\sqrt{x^{2} + 3} - \sqrt{5 - x^{2}}}$

OR

 Two cards are drawn at random from well- shuffled pack of 52 cards. What is the

 probability that either both are red or both are king.

Q.18 The cable of uniformly loaded suspension bridge hangs in the form of a parabola. The

 roadway which is horizontal and 100 m long is supported by vertical wires attached to the

 cable, the longest wire being 30 m and the shortest being 6 m. Find the length of a

 supporting wire attached to the roadway 18 m from the middle.

Q.19 An integer is chosen at random from the first 200 positive integers. Find the probability

 the integer is divisible by 6 or 8.

Q.20 A letter is chosen at random from the word ‘ASSASSINATION’. Find the probability

 That letter is (i) a vowel (ii) a consonant.

OR

 For what values of z, solve $\left|z\right|+z=\left(2+i\right)$

Q.21 Prove the following by using the principle of mathematical induction for all $nϵ N$.

 $\frac{1}{3 . 5}+\frac{1}{5 . 7}+\frac{1}{7 . 9}+…….+\frac{1}{\left(2n + 1\right)\left(2n + 3\right)}=\frac{n}{3\left(2n + 3\right)}$

Q.22 If $\left(x+iy\right)^{^{1}/\_{3}}=a+ib$ then show that $4\left(a^{2}-b^{2}\right)=\frac{x}{a}+\frac{y}{b}$ .

**Section – C**

Q.23 In a survey of 100 persons it was found that 28 read magazines A, 30 read magazine B,

 42 read magazines C, 8 read magazines A and B, 10 read magazines a and C, 5 read

 magazines Band C read all the three magazines. Find:

 (i)How many read none of the three magazines?

 (ii)How many read magazine C only?

Q.24 Find $\sin(\frac{x}{2}),\cos(\frac{x}{2}) and \tan(\frac{x}{2})$ in each of the following

 (i) $\tan(x=)-\frac{4}{3}, x in quadrant II$

 (ii) $\cos(x=)-\frac{1}{3}, x in quadrant III$

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

Q.25 if $\tan(θ)=\sec(2α,)$ prove that $\sin(2θ)=\frac{1-tan^{4}α}{1+tan^{4}α}$

OR

 If a and b are the roots of $x^{2}$ - 3x + p = 0 and c, d are the roots of $x^{2}$ - 12x + q = 0, where

 a, b, c, d form a GP. Prove that (q + p ) : (q - p) =17 : 25 .

Q.26 If three consecutive coefficient in the expansion of $\left(1+x\right)^{n}$ are in the ratio 6 : 33 : 110.

 Find n and r.

Q.27 If the first and the nth term of a G. P. are *a* and *b* respectively and p is the product of

 Its first n terms then prove that P2 = (*ab*)n .

Q.28 Find the domain and range of the function

 $\left\{\left(x, \frac{1}{1 - x^{2}}\right):x ϵ R, x\ne \pm 1\right\}$

Q.29 A bag contains 5 black and 6 red balls. Determine the number of ways in which 2 black and

 3 red balls can be selected from lot.

OR

 For what integers m and n does both $\lim\_{x\to 0}f\left(x\right), and \lim\_{x\to 1}f\left(x\right)$, exit, if

 $f\left(x\right)= \left\{\begin{array}{c}mx^{2}+n, x<0\\nx+m 0\leq x\leq 1\\nx^{3}+m, x>1\end{array}\right.$

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