Sample Paper – 2014
Class – X
Subject – Mathematics

TIME : 3 hr 15 min Marks : 100

Instruction :

1. All questions are compulsory.

2. Question no 1 to 8 MCQ carrying 1 marks.

3. Question no 9 to 14 short answer type question carrying 2 marks.

4. Question no 15 to 24 short answer type question carrying 3 marks.

5. Question no 25 to 34 long answer type question carrying 4 marks.

SECTION A

1 For some integer p, every odd integer is of the form :

(i) 2p+1 (iii) p – 1

(ii) p + 1 (iv) 2p

2 The product of a non-zero rational number and an irrational number is always :

(i) Zero (iii) Rational

(ii) One (iv) irrational

3 If α and β are the zeroes of the quadratic polynomial $f(x) = ax^2 + bx + c$ then the value of $\alpha^2\beta + \beta^2\alpha$ is :

(i) ab (ii) –ab

(iii) $\frac{b}{a}$ (iv) $-\frac{bc}{a^2}$

4 The system of equations given by $a_1x+b_1y+c_1=0$ *and* $a_2x+b_2y+c_2=0$, has infinite number of solution if :

(i) $\frac{a_1}{a_2}=\frac{b_1}{b_2}=\frac{c_1}{c_2}$

(ii) $\frac{a_1}{a_2}=\frac{b_1}{b_2}\neq\frac{c_1}{c_2}$

(iii) $\frac{a_1}{a_2}\neq\frac{b_1}{b_2}$

(iv) None of these

5 The graph of the system of equations given by x + y = 5; 2x + 2y = 7 is :

(i) a set of two parallel lines

(ii) a set of two coincident lines

(iii) a pair of straight line intersecting at a unique points

(iv) None of these.

6 Which of the following forms the set of sides of a right angled triangle:

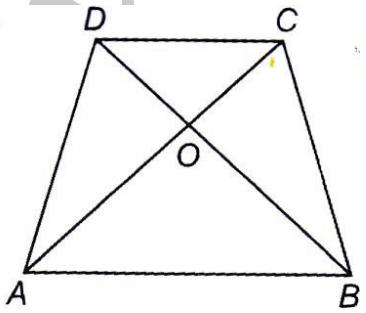
(i) 50cm, 80cm, 100cm

(ii) 5cm, 12cm, 13cm

(iii) 5cm, 6cm, 7cm

(iv) 10cm, 15cm, 20cm

7 In the given figure, ABCD is a trapezium in which AB || CD. If $\frac{CD}{AB} = \frac{1}{3}$, the ratio of the areas of triangles *OCD and OAB*



(i) 1 : 3

(ii) 2 : 3

(iii) 1 : 6

(iv) 1:9

8 The value of a variable which occurs most frequently in a distribution is called:

(i) Mean

(ii) Median

(iii) Mode

(iv) None of these

SECTION B

9 Show that any number of the form 4^n, $n \in N$ can never end with the digit zero.

10 What real number should be subtracted from the polynomial $\left(3x^2+10x^2-14x+9\right)$, so that $\left(3x-2\right)$ divides it exactly?

11 Find the median of the following frequency distribution :

Class Interval	Frequency
35 – 45	8
45 – 55	12
55 – 65	20
65 – 75	10

12 The area of two similar triangle ΔABC and ΔPQR are 25 cm^2 and 49 cm^2, respectively. If QR = 9.8 cm, find BC.

13 Use Euclid's division algorithm find the HCF of 196 and 38220.

14 2 audio and 3 video cassettes cost ` 425 and 3 audio and 2 video cassettes cost ` 350. Find the cost of 1 audio and 1 video cassette.

SECTION C

15 Use Euclid's Division algorithm to show that the square of any positive integer is either of the form 3m or 3m + 1 for some integer m.

16 A sweet-seller has 420 kaju barfis and 130 badam barfis. He wants to stack them in such a way that each stack has the same number, and they take up the least area on the tray. Find the number of barfis that can be placed in each stack for this purpose.

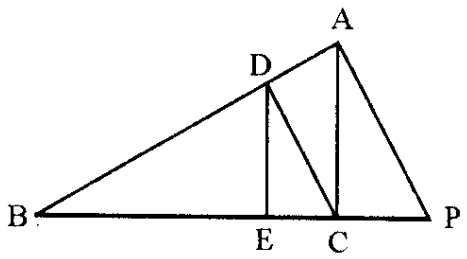
17 A lending library has a fixed charge for the first three days and an additional charge for each day thereafter. Saritha paid Rs 27 for a book kept for seven days, while Susy paid Rs 21 for the book she kept for five days. Find the fixed charge and the charge for each extra day.

18 Solve: $217x+131y=913; 131x+217y=827$

19 If 3 is a zero of the polynomial $p(x)=kx^2+(3k-1)x+k$ then find the value of k.

20 On dividing $2x^3-4x^2+x+7$ by a polynomial $g(x)$, the quotient and remainder are 2x and 7 – 5x respectively. Find $g(x)$.

21 In the given fig,. DE || AC and DC || AP prove that $\frac{BE}{EC}=\frac{BC}{CP}$



22 PQR is a triangle right angled at P and M is a point on QR such that $PM \perp QR$. Show that $PM^2 = QM \times MR$.

23 The mean of the following frequency distribution is 62.8 and the sum of all frequencies is 50. Compute the missing frequencies f_1 *and* f_2

Class interval	Frequency
0 – 20	5
20 – 40	F_1
40 – 60	10
60 – 80	F_2
80 – 100	7
100 – 120	8
TOTAL	50

24 The mode of the following distribution is 55. Find the value of x and y.

x	F
0 – 15	6
15 – 30	7
30 – 45	y
45 – 60	15
60 – 75	10
75 – 90	x
Total	51

SECTION D

25 Prove that $\sqrt{5}$ is an irrational number.

26 Obtain all other zeroes of $3x^4 + 6x^3 - 2x^2 - 10x - 5$, if two of its zeroes are $\sqrt{\frac{5}{3}}$ and $-\sqrt{\frac{5}{3}}$.

27 Solve the following system of linear equations graphically: $2x - y = 1$ and $x + 2y = 8$ also, find the coordinates of the points where the lines meet the axis of y.

28 Prove Pythagoras theorem. A ladder 17 m long, reaches a window of a building 15m above the ground. Find the distance of the foot of the ladder from the building.

29 During the medical check-up of 35 students of a class, their weights were recorded as follows:

Weight (in Kg)	Number of Students
Less than 38	0
Less than 40	3
Less than 42	5
Less than 44	9
Less than 46	14
Less than 48	28
Less than 50	32
Less than 52	35

Draw a less than type ogive of the given data. Hence obtain the median weight from the graph and verify using the formula.

30 Show that every positive odd integer is of the form $6q + 1$ or $6q + 3$ or $6q + 5$. Where q is some integer.

31 Find k if zeroes α, β are the polynomial $5x^2 + (2k+1)x + (k-2)$ are such that $2\alpha + 5\beta = 1$.

32 In an equilateral triangle PQR, the side QR is trisected at S. Prove that $9PS^2 = 7PQ^2$.

33 Roohi travels 300 km to her home partly by train and partly by bus. She takes 4 hours if she travels 60 km by train and the remaining by bus. If she travels 100 km by train and the remaining by bus, she takes 10 minutes longer. Find the speed of the train and the bus separately.

34 Find the mean marks from the following data

MARKS	Number of student
Below 10	5
Below 20	9
Below 30	17
Below 40	29
Below 50	45
Below 60	65
Below 70	77
Below 80	78
Below 90	83
Below 100	85