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 The decimal expansion of the rational number $\frac{43}{2^4 \times 5^3}$ will terminate after how many places of decimal.

(i) One decimal place
(ii) Two decimal place
(iii) three decimal place
(iv) four decimal place

2 Find the simplest form of $\frac{148}{185}$.

(i) $\frac{1}{5}$

(ii) $\frac{3}{5}$

(iii) $\frac{4}{5}$

(iv) $\frac{3}{4}$

3 The graphs of the equations $6x-2y+9=0$ and $3x-y+12=0$ are two lines which are :

(i) Parallel

(ii) Coincident

(iii) Intersecting exactly one point

(iv) Perpendicular to each other.

4 If in ΔABC and ΔPQR, $\frac{AB}{PQ}=\frac{BC}{PR}$ then they will be similar when :

(i) $\angle B=\angle P$

(ii) $\angle B=\angle Q$

(iii) $\angle A=\angle P$

(iv) $\angle A=\angle R$

5 $\frac{Sin\theta}{1+\cos\theta}$ is equal to

(i) $\frac{\cos\theta}{1+\sin\theta}$

(ii) $\frac{1-\cos\theta}{\sin\theta}$

(iii) $\frac{1-\sin\theta}{\cos\theta}$

(iv) None of these.

6 The value of $\left(\cos 60^o \cos 30^o - \sin 60^o \sin 30^o\right)$ is

(i) 0

(ii) 1

(iii) $\frac{1}{2}$

(iv) $\frac{\sqrt{3}}{2}$

7 If $\Delta ABC \sim \Delta PQR$ such that 2AB = 3PQ and BC = 12cm then QR is equal to :

(i) 8 cm

(ii) 6 cm

(iii) 12 cm

(iv) 10 cm

8 The relation connecting the measure of central tendency is :

(i) $Mode = 2median - 3Mean$

(ii) $Mode = 3median - 2Mean$

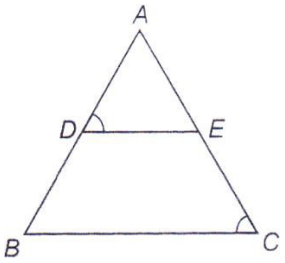
(iii) $Mode = 2median + 3Mean$

(iv) $Mode = 3median + 2Mean$

SECTION B

9 The HCF of two numbers is 27 and their LCM is 54, find the other.

10 In the given figure $\frac{AD}{DB}=\frac{AE}{EC}$ and $\angle ADE=\angle ACB$. Prove that ΔABC is an isosceles triangle.



11 Find LCM and HCF of 12, 15 and 21 by applying prime factorization ,method.

12 If $\tan(A+B)=\sqrt{3}$ and $\tan(A-B)=\frac{1}{\sqrt{3}}; 0^o<(A+B)\le 90^o; A>B$ find A and B.

13 A boy noted the numbers of cars passing through a spot on a road for 100 periods each of three minutes and summarised it in table given below. Find the mode of the data.

No of cars	(f)
0 – 10	7
10 – 20	14
20 – 30	13
30 – 40	12
40 – 50	20
50 – 60	11
60 – 70	15
70 – 80	8

14 Prove that $Sin^4 A-\cos^4 A=2\sin^2 A-1$

SECTION C

15 In a seminar the number of participants in English , Hindi and Mathematics are 60, 84 and 108, respectively. Find the minimum number of rooms required, if each the same numbers of participants are to be seated and all of them in the same subject.

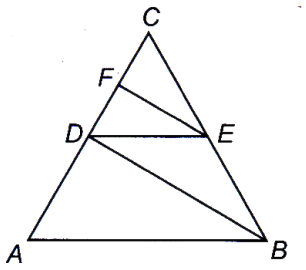
16 Express $0.2\overline{54}$ as a fraction in simplest form.

17 Solve graphically the system of linear equations $x+2y=3$ and $4x+3y=2$.

18 Prove that $\tan^2 A-\tan^2 B=\frac{\sin^2 A-\sin^2 B}{\cos^2 A\cos^2 B}$.

19 Prove that $\frac{1}{\cos ec\theta-\cot\theta}-\frac{1}{\sin\theta}=\frac{1}{\sin\theta}=\frac{1}{\cos ec\theta+\cot\theta}$

20 In the given figure, $AB \perp DE$ and $BD \perp EF$. prove that $DC^2 = CF \times AC$.



21 In a ΔABC, AB = AC and D is a point on AC such that $BC^2 = AC \times DC$. prove that BD = BC.

22 If the mean of the following distribution is 54, find the value of p.

Class Intervals	(f)
0 – 20	7
20 – 40	P
40 – 60	10
60 – 80	9
80 – 100	13

23 Solve for x and y $\begin{cases} ax + by - a + b = 0 \\ bx - ay - a - b = 0 \end{cases}$.

24 Find the median for the following frequency distribution.

Height (in cm)	(f)
160 – 162	15
163 – 165	117
166 – 168	136
169 – 171	118
172 – 174	14

SECTION D

25 Divide $2x^4 - 9x^3 + 5x^2 + 3x - 8$ by $x^2 - +1$ and verify the division algorithm.

26 Prove that in a right angled triangle the square of the hypotenuse is equal to the sum of the squares of the other two.

27 Prove that $\sqrt{\frac{1-\cos\theta}{1+\cos\theta}} + \sqrt{\frac{1+\cos\theta}{1-\cos\theta}} = 2\cos ec\theta$

28 Show that one and only one out of n, n + 4, n + 8, n + 12 and n + 16 is divisible by 5, where n is any positive integer.

29 A shopkeeper gives books on rent for reading. She takes a fixed charge for the first two days, and an additional charge for each day thereafter. Latika paid Rs 22 for a book kept for six days, while Anand paid Rs 16 for the book kept for four days. Find the fixed charges and the charge for each extra day.

30 Prove that the area of the equilateral triangle drawn on the hypotenuse of a right angled triangle is equal to the sum of the areas of the equilateral triangles drawn on the other two sides of the triangle.

31 Thirty women were examined in a hospital by a doctor and the number of heart beats per minute were recorded and summarised as followes. Find the mean hert beats per minute for these women, choosing a suitable method.

No of heart beats per minute	(f)
65 – 68	2
68 – 71	4
71 – 74	3
74 – 77	8
77 – 80	7
80 – 83	4
83 – 86	2

32 Use Euclid's division lemma to show that the cube of any positive integer can be either of the form 9m , 9m +1 or 9m + 8.

33 If two zeroes of the polynomial $x^4 - 6x^3 - 26x^2 + 138x - 35$ are $2 \pm \sqrt{3}$, find other zeroes.

34 The following distribution gives the daily income of 50 workers of a factory. Convert the distribution above to a less than type cumulative frequency distribution and draw its ogive.

DAILY INCOME (in `)	Number of workers
100 – 120	12
120 – 140	14
140 – 160	8
160 – 180	6
180 – 200	10