SAMPLE QUESTION PAPER 2015

SUMMATIVE ASSESSMENT – I, 2015 MATHEMATICS Class – X

General Instructions:

The question paper consists of 31 questions divided into four sections A, B, C and D.

Section - A comprises of 4 questions of 1 mark each;

Section - B comprises of 6 questions of 2 marks each;

Section - C comprises of 10 questions of 3 marks each and

Section - D comprises of 11 questions of 4 marks each.

Section - A

1. If $\triangle ABC \sim \triangle DEF$, BC = 3EF and area ($\triangle ABC$) = 117 cm^2, then find area (DEF).

2. Find the value of $4\operatorname{cosec}^2 60^0 - 16 \tan^2 30^0$.

3. Find the value of $\sin 60^0 \cos 30^0 - \cos 60^0 \sin 30^0$.

4. Weekly household expenditure of families living in a housing society are shown below :

Weekly Expenditure (in Rs)	Up to 3000	3000-6000	6000-9000	9000-12000	12000-15000
Number of Families	4	25	31	48	10

Find the upper limit of the modal class.

Section – B

5. Find whether decimal expansion of 13/64 is a terminating or non-terminating decimal. If it terminates, find the number of decimal places its decimal expansion has.

6 . Find the prime factorisation of the denominator of the rational number equivalent to 1.033.

7 . Check whether $x^3 - 4x^2 - 3x + 2$ is divisible by x - 2

8 . Find the side of a rhombus whose diagonals are of length 60 cm and 80 cm.

9. Find the value of , if: $\dfrac{\cos A}{1-\sin A} + \dfrac{\cos A}{1+\sin A} = 4$

10. Given below is the distribution of weekly pocket money received by students of a class. Calculate the pocket money that is received by most of the students.

Pocket Money(in Rs.)	0-20	20 – 40	40 – 60	60-80	80-100	100-120	120-140
No of students	2	2	3	12	18	5	2

Section – C

11. Three bells toll at intervals of 12 minutes, 15 minutes and 18 minutes respectively. If they start tolling together, after what time will they next toll together ?

12. Determine graphically whether the following pair of linear equations $4x+6y = 96$ and $2x + 3y = 6$ has (i) a unique solution, (ii) infinitely many solutions or (iii) no solution
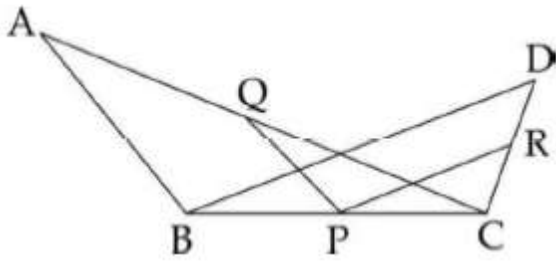
13. Find the zeroes of the quadratic polynomial $3x^2 - 2$ and verify the relationship between the zeroes and the coefficients.

14.

If the polynomial $6x^4 + 8x^3 + 17x^2 + 21x + 7$ is divided by another polynomial $3x^2 + 4x + 1$, the remainder comes out to be $ax + b$. Find a and b.

15. In a rhombus prove that four times the square of any side is equal to sum of the squares of its diagonals.

16. In the figure $\triangle$ ABC and $\triangle$ DBC have same base BC and lie on the same side. If PQ II BA and PR II BD, then prove that QR II AD.

17. Evaluate : cosec 39^0 . cos 51^0 + tan 21^0 .cot 69^0 - sec^2 21^0

18. Simplify : $\frac{sin^3\theta - cos^3\theta}{sin\theta - cos\theta}$

19. In a small scale industry, salaries of employees are given in the following distribution table :

Salary (in Rs.)	4000-500	5000-6000	6000-7000	7000-8000	8000-9000	9000-10000
Number of employees	20	60	100	50	80	90

Find the mean salary of the employees.

20. In a study on asthmatic patients, the following frequency distribution was obtained. Find the average (mean) age at the detection.

Age at detection (in years)	0-9	10-19	20-29	30-39	40-49
Number of patients	12	25	13	10	5

Section – D

21 . Find the greatest 5 digit number which is exactly divisible by 12, 18 and 24.

22. A man started his job with a certain monthly salary, and earned a fixed increment every year. His salary was Rs. 15,000 after 4 years of service and Rs.18,000 after 10 years of service. What was his starting salary and his annual increment?

What character you can imbibe from his life ?

23. 5 years ago, age of one sister was twice the other sister. 5 years hence their ages will be in the ratio

2 : 3. Find their present ages.

24 . Divide polynomial $x^4 - 6x^3 + 8x^2 + 5x - 7$ by x 1 and find quotient and remainder. Also verify the division

algorithm.

25. If P,Q,R and S are the middle points of a quadrilateral ABCD, then prove that PQRS is a parallelogram.

26. If $\triangle ABC \sim \triangle PQR$ and AD, PS are bisectors of corresponding angles A and P, then prove that

$$\frac{ar\,(\triangle ABC)}{ar\,(\triangle PQR)} = \frac{AD^2}{PS^2}$$

27. Prove that : $(\tan\theta + \sec\theta - 1).(\tan\theta + 1 + \sec\theta) = \frac{2\sin\theta}{1-\sin\theta}$

28. if $\sin\theta = \frac{C}{\sqrt{c^2+d^2}}$ and d >0 find the value of cos θ and tan θ

29. if m = cos A - sin A and n = cos A + sin A, show that

$$\frac{m^2 + n^2}{m^2 - n^2} = \frac{-1}{2}\,SecA.Cosec\,A = \frac{\cot A + \tan A}{2}$$

30. For one term, absentee record of students is given. If mean is 15.5, find the missing frequencies x and

y.

Number of days	0- 5	5- 10	10-15	15-20	20-25	25-30	30-35	35-40	Total
Number of students	15	16	x	8	y	8	6	4	70

31. Pocket expenses of a class in a college are shown in the following frequency distribution :

Pocket expenses (in Rs)	0-200	200 - 400	400-600	600-800	800-100	1000-1200	1200-1400
Number of students	33	74	170	88	76	44	25

Find the mean and median for the above data..