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. A girl walks 500 m towards east and then 1200 m towards north. Find her distance from the starting point.

2. Find the value of $\tan^2 10^0 - \cot 2\ 80^0$.

3. Find the value of $\sec 2\ 42^0 - \operatorname{cosec} 2\ 48^0$.

4. If class marks of a distribution are 10, 20, 30, 40, ……. find first and fifth class intervals.

Section – B

5. Show that 14^n cannot end with digit zero for any natural number n.

6 . Find the prime factorisation of the denominator of the rational number equivalent to 8.39.

7 . If the sum of two positive numbers is 44 and one number is three times the other number, then find the numbers.

8 . Let Δ ABC $\sim$ Δ DEF. If ar(Δ ABC) = 100 cm^2, ar(Δ DEF) = 196 cm2 and DE = 7 cm, then find AB.

9. Prove that : $\sec^4\theta - \sec^2\theta = \tan^4\theta + \tan^2\theta$

10. The widths of 50 leaves of a plant were measured in mm and their cumulative frequency distribution is shown in the following table. Make frequency distribution table for this.

Width in (mm)	≥ 20	≥ 30	≥ 40	≥ 50	≥ 60	≥ 70	≥ 80
Cumulative frequency	50	44	28	20	15	7	0

Section – C

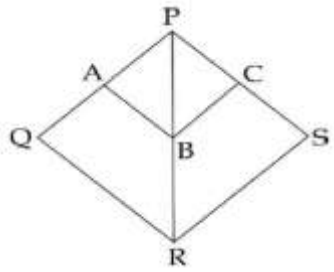
11. Pens are sold in pack of 8 and notepads are sold in pack of 12. Find the least number of pack of each type that one should buy so that there are equal number of pen and notepads.

12. If three zeroes of a polynomial $x^4 + 3x^3 - 4x^2 - 12x$ are 2, 0 and - 2, then find the fourth zero.

13. The sum of the digits of a two digit number is 8 and the difference between the number and that formed by reversing the digits is 18. Find the number.

14. Solve using cross multiplication method: $2x + y = 5$ and $3x + 2y = 8$

15. In figure AB II QR and BCII RS. Prove that PA/PQ = PC/PS



16. AM and PN are perpendiculars on BC and QR resp. If Δ ABC ~ Δ PQR, then prove that

(i) Δ AMC ~ Δ PNR (ii) AM/ BC = PN/ QR

17. Given $2\cos 3\theta = \sqrt{3}$, find the value of θ.

18. When is an equation called 'an identity'. Prove the the tigonometric identity $1 + \tan^2 A = \sec^2 A$

19. For helping poor girls of their class, students saved pocket money as shown in the following table :

Money saved (in Rs)	5-7	7-9	9-11	11-13	13-15
Number of students	6	3	9	5	7

Find mean and median for this data.

20. Calculate the mean for the following frequency distribution :

Class	10-30	30-50	50-70	70-90	90-110
Frequency	15	18	25	10	2

Section – D

21 .Express the HCF of number 72 and 124 as a linear combination of 72 and 124.

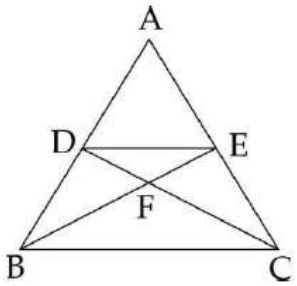
22. Rani decided to distribute some amount to poor students for their books. If there are 8 students less, everyone will get Rs. 10 more. If there are 16 students more everyone will get Rs.10 less. What is the number of students and how much does each get ? What is the total amount distributed? What is the reason that motivated Rani to distribute money for books ?

23 .If a polynomial $3x^4 - 15x^3 + 14x^2 + 2px - q$ is exactly divisible by $x^2 - 5x + 6$, then find the value of p and q.

24 .Obtain all other zeroes of the polynomial $x^4 + x^3 - 16x^2 - 4x + 48$, if two of its zeroes are 2 and - 4.

25. In Δ ABC, AD$\perp$ BC and point D lies on BC such that 2 DB = 3 CD. Prove that $5\,AB^2 = 5\,AC^2 + BC^2$

26. In a Δ ABC, DEII BC. If AD : DB = 3 : 5, then find $\frac{ar\,(\Delta DEF)}{ar\,(\Delta CFB)}$



27. If $\sec\theta + \tan\theta = p$, show that $\frac{p^2-1}{p^2+1}\,cosec\theta = 1$

28. If $x = \tan A + \sin A$ and $y = \tan A - \sin A$, prove that : $\left(\frac{x+y}{x-y}\right)^2 - \left(\frac{x+y}{2}\right)^2 = 1$

29. If cosec (A+B) = 1 and sec(A - B) = 2, evaluate : (i) sin A cos B +cos A sin B. (ii) $\frac{\tan A + \tan B}{1 - \tan A\,.\tan B}$

30. Following distribution gives the marks obtained, out of 200, by the students of class IX in their class test

Marks	0-25	25-50	50-75	75-100	100-125	125-150	150-175	175-200
Number of students	10	15	22	30	28	27	12	6

Find the mean and mode of the data.

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

Weight (in kg)	38-40	40-42	42-44	44-46	46-48	48-50	50-52
Number of students	3	2	4	5	14	4	3

Draw a 'less than type' ogive for the given data. From the curve, obtain the median weight and verify the result by actual calculations of median.