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. Three sides of a triangle are a, 3a and $\sqrt{10}$ a. Find the measurement of angle opposite to the largest side.

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

3. In a right angled $\triangle$ ABC, if <B =90^0, AB = 20 cm and BC=21 cm, find the value of sec A.

4. Find median, using an empirical relation, when it is given that mode and mean are 8 and 9 respectively.

Section – B

5. Express 23150 as product of its prime factors. Is it unique ?

6 . Find LCM of the numbers given below : m, 2m, 3m, 4m and 5m, where m is any positive integer.

7 . Solve the following pair of linear equations : *y - 4x = 1 and* 6x - 5y = 9

8 . In the figure AB II CD and area($\triangle$AOB) = 64 cm2. If AB =2DC, then find area($\triangle$ COD).
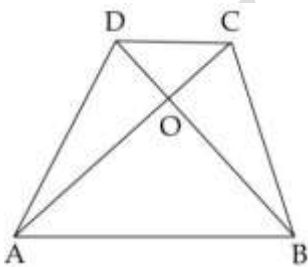
9. If *x* = a cosθ - b sin θ and *y* = a sin θ + b cos θ, then prove that $a^2 + b^2 = x^2 + y^2$.

10. The following table shows the daily consumption of milk in 40 houses of a locality:

Consumption (in litres)	0 - 0.5	0.5 - 1	1 – 1.5	1.5 – 2	2 – 2.5
Number of houses	7	15	10	5	3

Find the modal class and median class for the data.

Section – C

11. Prove that $\frac{5\sqrt{3}}{11}$ is an irrational number.

12. What should be added in the polynomial $x^3 - 3x^2 + 6x - 15$ so that it is completely divisible by $x - 3$.

13. Divide the polynomial $x3 - 2x2 + 4x - 18$ by the polynomial $x - 3$ and verify the division algorithm.
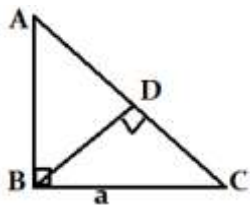
14. $2x = 5y + 4$ is given. Write another linear equation, so that the lines represented by the pair are :
(i) intersecting (ii) coincident (iii) parallel

15. ABCD is a square. If E and F are such that BE is one-third of AB and BF is one-third of BC and area (∆BEF) = 128 sq. cm,. Then find diagonal BD of the square.
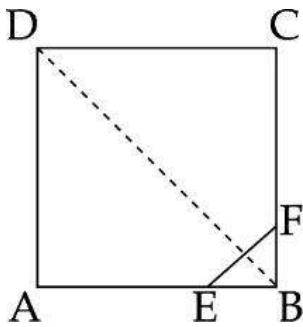
16. In ∆ ABC , <B = 90^0, BD ⊥ AC, ar (∆ ABC) = A and BC = a , then prove that BD = $\frac{2Aa}{\sqrt{4A^2 + a^4}}$

17. Simplify :

$$3\left(\frac{\sin 36^\circ}{\cos 54^\circ}\right)^2 - 2\left(\frac{\tan 18^\circ}{\cot 72^\circ}\right)^3 + 2\tan 13^\circ.\tan 21^\circ.\tan 69^\circ.\tan 77^\circ$$

18. When is an equation called 'an identity'. Prove the trigonometric identity $1 + \tan2\,A = \sec^2 A$

19. In the following distribution, if mean is 78, find the missing frequency (x) :

Class	50- 60	60-70	70-80	80-90	90-100
Frequency	8	6	12	11	x

20. In a health check up, the number of heart beats of 40 women were recorded in the following table:

Number of heart beats/minute	65-69	70-74	75-79	80-84
Number of women	2	18	16	4

Section – D

21. if cos (A+ B) = 0 and cot (A- B) = √3 then find the value of (i) sec A.tan B - cot A.sin B (ii) cosec A.cot B + sin A.tan B

22. On the independence day celebration in the school, number of students participated in the celebration. School management has decided to distribute some sweets amongst the participants and the audience. If total number of sweets were represented by $8x^4 \square 14x^3 \square 2x^2 \square 7x \square 8$, each one received $2x^2 \square 2x \square 1$ sweets and $14x \square 10$ remained undistributed, find the number of students to whom sweets were distributed.

Why it is important to celebrate Independence Day ?

23. Two years ago, a father was five times old as his son. Two years later from today his age will be 8 years more than three times the age of his son. Find their present ages.

24 . Obtain all other zeroes of $3x^4$ - $14x^2$ + 8, if two of its zeroes are $\sqrt{\frac{2}{3}} \ and - \sqrt{\frac{2}{3}}$

25. Δ ABC is right angled at C. P and Q divide AC and BC in 2 : 3. Prove that
(i) 25 BP^2 = 9 AC^2 + 25 BC^2 (ii) 25 AQ^2 = 25 AC^2 + 9 BC^2 (iii) 25 (AQ^2 + BP^2) = 34 AB^2

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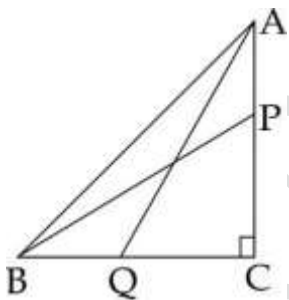
26. In two triangles ABC and DEF, if AB, AC and median AX are respectively proportional to DE, DF and median DY, then prove that Δ ABC~Δ DEF.

27. If secθ - tanθ = 2 tanθ , then show that secθ + tanθ = 2 secθ.

28. A rhombus has each side of length 20 cm and one pair of opposite angles 60^0 each. Find the length of the diagonals

29. if m = tan A + sin A and n = tan A + sin A, show that $(m^2 + n^2)^2 = 16mn$

30. A trader with basket of eggs find that , if he sell 3 eggs at time there is only one egg left . if he sell 4 eggs at time there is again only one egg left . if trader sell 7 eggs at time there are no egg left. if the capacity of basket is 100 eggs. Find how many eggs are there in basket?

OR,

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..

Or,

In right triangle ABC ,<C = 90^0 and D,E,F are three point on BC such a way that they divide it in equal parts. Then prove that $8(AF^2 + AD^2) = 11 AC^2 + 5 AB^2$