SUMMATIVE ASSESSMENT – I, 2016-17 89IH6AW
गणित / MATHEMATICS
कक्षा – X / Class – X

Time Allowed: 3 hours **Maximum Marks: 90**

SECTION - A

1. In AXYZ, A and B are points on the sides XY and XZ respectively such that AB II YZ. If AY = 2.2 cm, XB = 3.3 cm and XZ = 6.6 cm, then find AX.

2. If A + B = 90°, and secA = 5/3, then find the value of cosec B.

3. If tan(3x — 15°) = 1, then find the value of x.

4. Find the mode of the data, using an empirical formula, when it is given that median = 41.25 and mean =33.75.

SECTION - B

5. Determine the values of p and q so that the prime factorisation 2520 is expressible as $2^3x3^p\ x\ q\ x\ 7$

6. What is the decimal expansion of the rational number $\frac{201}{250}$

7 .Find whether the lines representing the following pair of linear equabJns intersect at a point, are parallel or coincident: 3x+y=7 and 6x+2y=8

8 .Two pillars of heights 70 m and 20 m are standing 120 m apart. Find the distance between their tops.

9. Find the value of : $\frac{\tan 30° + \tan 45°}{1 - \tan 30°.\tan 45°}$

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

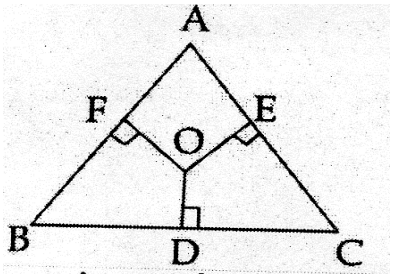
Find the modal class and median class for the data.

SECTION - C

11. Find the HCF of 180, 252 and 324 by Euclid's Division algorithm.

12. Divide the polynomial $x^3 - 3x^2 + 3x + 4$ by the polynomial x - 2 and verify the division algorithm

13. If the sum and product of the zeroes of the polynomial $ax^2 - 6x +$ c is equal to 12 each, find the value of “a” and “c” each.

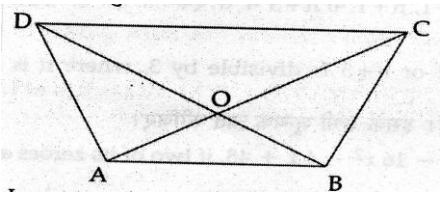


14 .Solve by elimination: 9x +10y = 29 and 10x + 9y = 28

15. In Δ ABC, from any interior point O of the triangle, OD ⊥ BC, OE⊥ AC and OF ⊥ AB are drawn.

Prove that $OA^2 + OB^2 + OC^2 = OD^2 + OE^2 + OF^2 + AF^2 + BD^2 + CE^2$

16. A In a trapezium ABCD, AB II DC, If DC = 2AB, show that the point of intersection of the two diagonals is a point of trisection.



17 if cot B = 12/5 then show that $\tan^2 B - \sin^2 B = \sin^2 B.\ \tan^2 B$.

18. Prove that: $\frac{1+\sec A}{\sec A} = \frac{\sin^2 A}{1-\cos A}$

19. In annual examination, marks (out of 90) obtained by students of Class IX in mathematics are given below :

Marks	0-15	15-30	30-45	45-60	60-75	75-90
Number of students	2	4	5	20	9	10

Find the mean marks.

20 .For the following data, find mode:

Class	10 - 13	13 - 16	16 - 19	19 - 22	22 - 25
Frequency	4	8	9	11	7

SECTION - D

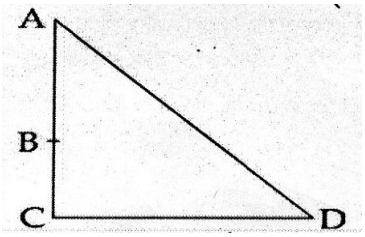
21. Prove that only one of the numbers n-1, n + 1 or n + 3 is divisible by 3, where n is any positive integer. Explain.

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

23 .solve graphically the pair of linear equations : 5x - y = 5 and 3x - 2y = - 4

Also write the coordinates of the point of intersection of these lines with y - axis. Hence shade the region enclosed by these lines and y- axis.

24. A man started his job with a certain monthly salary, and earned a fixed increment every year. His salary was 15,000 after 5 years service and 19,000 after 10 years service. What was his starting salary and his annual increment? Which character you can imbibe from his life?



25 .In the right triangle, B is a point on AC such that AB + AD= BC +CD, If AB = x, BC = h and CD = d, then find x (in terms of h and d)

26. In Δ ABC, from A and B altitudes AD and BE are drawn. Prove that Δ ADC ~ Δ BEC.

Is Δ ADB ~ Δ AEB and ΔADB ~Δ ADC?

27. If $(\cos\theta + \sin\theta) = \sqrt{2}\sin(90° - \theta)$, show that $(\sin\theta - \cos\theta) = \sqrt{2}\cos\theta$

28 If m = cos A – sin A and n = cos A + sin A, show that $\frac{m^2 + n^2}{m^2 - n^2} = -\frac{1}{2}\sec A \cdot \operatorname{cosec} A = -\frac{(\cot A + \tan A)}{2}$

29 .Prove the identity $\sin^2\theta + \cos^2\theta = 1$ and use it to prove $\sin^4\theta - \cos^4\theta = 1 - 2\cos^2\theta$

30. Following is the age distribution of cardiac patients admitted during a month in a hospital:

Age (in years)	20-30	30-40	40-50	50-60	60-70	70-80
Number of patients	2	8	15	12	10	5

Draw a 'less than type' and a 'more than type' ogive and from the curves, find the median.

31. On Sports day of a school, age-wise participation of students is shown in the following

Age (in years)	5-7	7-9	9-11	11-13	13-15	15-17	17-19
Number of students	x	15	18	30	50	48	x

Find the mode of the data. Also, find missing frequencies when sum of frequencies is 181.