SUMMATIVE ASSESSMENT – I, 2016-17   QVHDP01
MATHEMATICS   Class – X

Maximum Marks: 90

Time Allowed: 3 hours

1. X and Y are points on the sides AB and AC respectively of a triangle ABC such that $\frac{AX}{AB} = \frac{1}{4}$, AY= 2 cm and YC = 6 cm. Find whether XYII BC or not.

2. Evaluate $\frac{cosec\ 13°}{Sec\ 77°} = \frac{cot\ 20^0}{tan\ 70^0}$

3. if x = 3 sin θ and y = 4 cos θ, find the value of $\sqrt{16x^2 + 9\ y^2}$

4 . If the median of the series exceeds the mean by 3, find by what number the mode exceeds its mean.

SECTION - B

5. Check whether 4^n can end with the digit 0 for any natural number n.

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

7. Given the linear equation 3x - 4y = 9 write another linear equation in these two variables such that the geometrical representation of the pair so formed is (i) intersecting lines (ii) coincident lines

8. In a rectangle A8CD, E is the middle point of AD. If AD = 40 m and AB-48 m, then find EB

9. If Sin (A + B) = 1 and sin (A – B) = $\frac{1}{2}$, then find A and B.

10. The following table shows the daily Consumption of milk in an 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 media class for the data.

SECTION - C

11. Find the HCF of 1620, 1723 and 255 by Euclid's Division algorithm.

12. On dividing the polynomial $4x^4$ - $5x^3$- $39x^2$ - 46x - 2 by the polynomial g(x).the quotient and remainder were x^2 - 3x - 5 and – 5x + 8 respectively. Find g (x)

13. If α and β are zeroes of a polynomial x^2 + 6x + 9, then form a polynomial whose

zeroes are – α and - β

14. Solve the following pair of equations: 49x + 51y = 499 and 51x + 49y = 501

15. In the figure, if EFII DC II AB, then prove that AE/ ED = BF/ FC

16. In the given figure,∆ ABC, PQ II BC and BC =3 PQ. Find the ratio of the area of PRQ and area CRB where PC and BQ intersect at R.

17. Given a right angled ∆ ABC, right angled at B. In which tan A = $\frac{15}{8}$ and tan C = $\frac{8}{15}$,

then find the value of   sin A. cos C + cos A.sin C
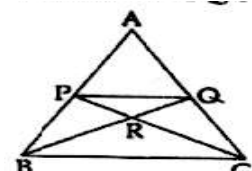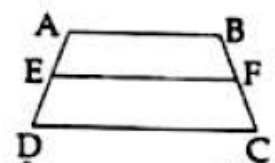
18. Prove that: $(\text{cosec}\theta - \sin\theta)(\sec\theta - \cos\theta) = \sin\theta\cos\theta = \dfrac{1}{\tan\theta + \cot\theta}$ 19. In a school IQ of students of Class X are given in the following frequency distribution:

IQ	120-130	130-140	140-150	150-160	160 - 170
Number of students	10	80	100	50	10

Find the mean IQ of students.

20. An NGO working for welfare of cancer patients, maintained its records as follows: Find mode.

Age of patients (in years)	0-20	20-40	40-60	60-80
Number of patients	35	315	120	50

SECTION-D

21. Prove that only one of the number 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 the following pair of linear equations graphically 6x – y + 4 = 0 and 2x - 5y = 8 . Shade the region bounded by the lines and y- axis.

24. Raghav scored 70 marks in a test, getting 4 marks for each right answer and losing I mark for each wrong answer. Had 5 marks been awarded for each correct answer and 2 marks been deducted for each wrong answer, then Raghav would have scored 80 marks. How many questions he attempted.

Which value would Raghav violate if he resorts to unfair means?

25. On three line segments OA, OB and OC there are points L, M and N respectively such that LM II AB and MN II BC. If L, M, N and A, B, C are non-collinear points, then prove that LN II AC.

26. Two poles of height 'p' and 'q' metres are standing vertically on a level ground, 'a' metres apart. Prove that the height of the point of intersection of the lines joining the top of each pole to the foot of the opposite pole is given by $\dfrac{pq}{p+q}$

27. if $\theta = 45^0$ then verify the following (i) $\sin2\theta =. 2\sin\theta\cos\theta$) (ii) $\cos2\theta = \cos^2\theta — \sin^2\theta$.

28. If tan A + sin A = m and tan A - sin A = n, then prove that $(rn^2 - n^2)^2 = 16\ mn$.

29. If $\sec\theta - \tan\theta = x$, show that: $\sec\theta = \dfrac{1}{2}\left(x + \dfrac{1}{x}\right)$ and $\tan\theta == \dfrac{1}{2}\left(x - \dfrac{1}{x}\right)$

30. Production yield per hectare of wheat of some farms of a village are given in the following table

Production (kg/ha)	40- 45	45 - 55	55 - 60	60 - 65	65 - 70	70- 75	75-80	80 - 85
Number of farms	1 9	15	18	40	26	16	14	10

Draw a 'less than type' ogive and amore than type' ogive for this data

31. Find the missing frequencies and the median for the following distribution if the mean is 1.46

No. of accidents	0	1	2	3	4	5	Total
No. of days	46	x	y	25	10	5	200