SUMMATIVE ASSESSMENT - I, 2016 -17 **MATHEMATICS - Class - X Question paper – 5 [Code: R1QYSF7]**

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

SECTION – A

1. In $\triangle$ DEW, AB II EW. If AD =4 cm, DE =12 cm and DW = 24 cm, then find the value of DB.

2. Find the value of $\frac{1}{3} \times \frac{\cos 36^0}{\sin 54^0} - \frac{3}{2} \frac{\sec 16^0}{\cos e 74^0}$ 3. if $\sqrt{3}$ sinθ = cosθ find the value of $\frac{3\cos^2\theta + 2\cos\theta}{3\cos\theta + 2}$

4. Which central tendency is obtained by the abscissa of point of intersection of less than type and more than type ogive?   **Section – B**

5. Prove that $\sqrt{2}$ +$\sqrt{5}$ is an irrational number? 6. Check whether 6^n can end with the digit 0 for any natural number n.

7. Find a quadratic polynomial, sum and product of zeroes are -1/5 and 1/5 respectively.

8. In isosceles triangle ABC right angle at B. Prove that $AC^2 = 2AB^2$

9. $\triangle$ XYZ is right angled at Y, if XY = 5 and, XZ = 5$\sqrt{2}$ cm, then determine the values of <X and <y.

10. If mean of the set of observation is $\bar{x}$, Then evaluate $\sum x_1 - \bar{x}$

Section – C

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

12. Solve for x and y : $\frac{5}{x-1} + \frac{1}{y-2} = 2 \ and \ \frac{6}{x-1} - \frac{3}{y-2} = 1$

13. For what value of k, will the following equations have infinite solution: 2x + 3y = 4 ; (k+2)x + 6y = 3k + 2

14. State whether the given pair of triangles, are sirnilar or not. In case of similarity mention the criterion.
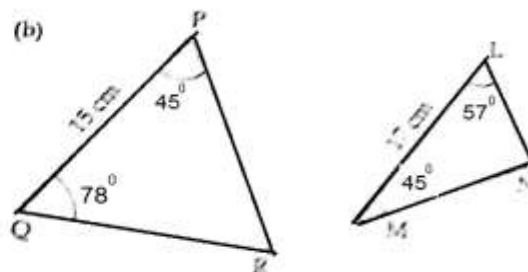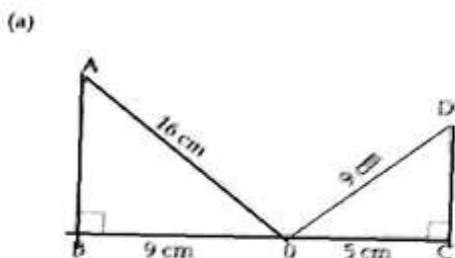
15. Simplify: $\frac{\sin^3\theta + \cos^3\theta}{\sin\theta + \cos\theta}$ 16.   Calculate the mode of the following frequency distribution

Marks	2- 4	4 - 6	6 - 8	8-10
No. students of students	3	4	2	1

17. In $\triangle$ ABC , D is point of side BC such that < ADC = <BAC . Prove that AC^2 =BC x CD

18. Divide the polynomial $2x^4 - 6x^3 + 7x^2 - 4x -2$ by the polynomial $2x^2 - 2x + 1$ and verify division algorithm.

19. if b cosθ = a then prove that cosecθ + cotθ = $\sqrt{\frac{b+a}{b-a}}$

20. Find the unknown entries a, b, c, d, e and f in the following distribution of heights of students in a class;

Height (in cm)	150 – 155	155 - 160	160 - 165	165-170	170 -175	175 - 180	Total
Frequency	a	15	b	9	c	12	70
Less than type c.f.	13	d	38	e	58	f	

21. In Δ ABC , <C = 90^0 and BC = a , CA = b and AB = c and p is length of perpendicular drawn from C to AB then prove that (i)cp = ab (ii) $\frac{1}{p^2} = \frac{1}{a^2} + \frac{1}{b^2}$

22. A person invested some amount at the rate of 10% simple interest and some other amount at the rate at 12% simple interest. He received yearly interest of 130. But if he had interchanged the amount invested he would have to receive Rs. 4 more as interest. How much amount did he invested at different rate?

23. Find all the zeroes of polynomial x^4 – 3x^3 + 6x – 4 if two its zeroes are √2 and -√2

24. HUDA (Haryana Urban Development Authority) has auctioned plots in a land for making new residential area, with a condition that each house has to leave a particular part of their plot for the plantation. The total area of land given is represented by 613+1712-4i + number of plots allotted is 2x + 7 and area of each plot is 3x^2 — 5x +3. Find the area reserve in each plot for plantation and the total area of land reserved for the plants; Why I IUDA has made such type of clause for making house in that land?
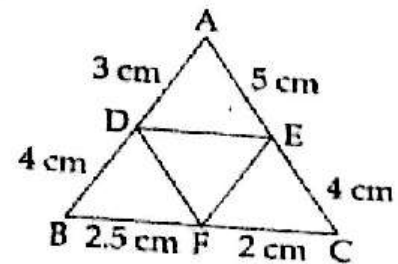
25. In the given figure, AD =3 cm, AE = 5 cm, BD = 4 cm, CE =4 cm, CF = 2 cm ,BF = 2.5 cm then find the pair of parallel lines and hence their lengths.

26. In ΔABC, from A and B altitudes AD and BE are drawn. Prove that Δ ADC ~ Δ BEC. Is Δ ADB ~ ΔAEB and ΔADB ~ ΔADC ?

27. Find cos45° and cot45° geometrically.   28. If cosθ + sinθ = √2cosθ show that cosθ — sinθ = √2 sinθ.

29. $if\ l\ sec\theta— m\ tan\theta + n = 0\ and\ l'\ sec\theta — m'tan\theta + n' = 0 ,prove\ that : \left(m'n — mn'\right)^2 — \left(n'l — nl'\right)^2 = \left(l'm — lm'\right)^2$

30. On annual day of a school, 400 students participated in the function. Frequency distribution showing their ages is as shown in the following table. Find mean and median of the given data.

Ages (in years)	05-67	07-09	09-11	11-13	13-15	15-17	17-19
Number of students	70	120	32	100	45	28	5

31. The following observation are about the height of 800 peoples. Draw less than type ogive?

Height(cm)	135-140	140 - 145	145 - 150	150 - 155	155 - 160	160 - 165	165 - 170	170-175
No. of persons	50	70	80	150	170	100	95	85