

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

**Time Allowed: 3 hours**

**Maximum Marks: 90**

**SECTION – A**

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

2. Find the value of  $\frac{1}{3} \times \frac{\cos 36^\circ}{\sin 54^\circ} - \frac{3}{2} \frac{\sec 16^\circ}{\csc 74^\circ}$       3. if  $\sqrt{3} \sin \theta = \cos \theta$  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  $\angle X$  and  $\angle Y$ .

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

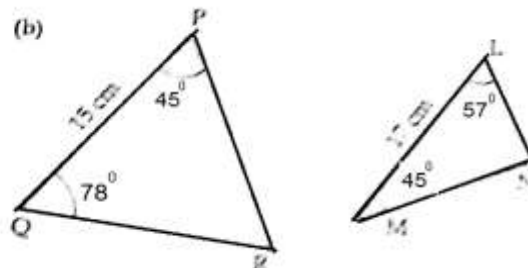
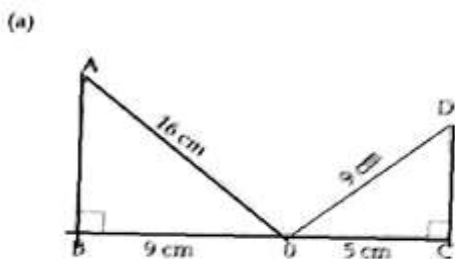
**Section – C**

11. Three bells toll at intervals of 12 minutes, 15 minutes and 18 minutes respectively. If they start tolling together, after 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 similar 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	3	4	2	1

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

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  $b \cos\theta = a$  then prove that  $\operatorname{cosec}\theta + \cot\theta = \sqrt{\frac{b+a}{b-a}}$

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

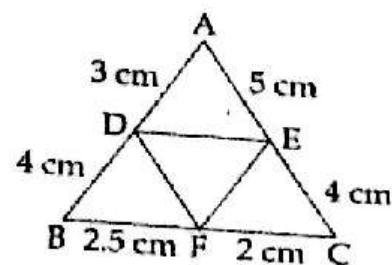
Height (in cm)	150 – 155	155 - 160	160 - 165	165-170	170 -175	175 - 180	Total
Frequency	a	15	b	9	c	12	70
Less than type c.f.	13	d	38	e	58	f	

21. In  $\Delta ABC$ ,  $\angle C = 90^\circ$  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 invest at different rate?

23. Find all the zeroes of polynomial  $x^4 - 3x^3 + 6x - 4$  if two its zeroes are  $\sqrt{2}$  and  $-\sqrt{2}$

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  $y^2 + 6x^3 + 17x^2 - 4x + 35$  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 HUDA 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  $\Delta ABC$ , from A and B altitudes AD and BE are drawn. Prove that  $\Delta ADC \sim \Delta BEC$ . Is  $\Delta ADB \sim \Delta AEB$  and  $\Delta ADB \sim \Delta ADC$  ?

27. Find  $\cos 45^\circ$  and  $\cot 45^\circ$  geometrically.

28. If  $\cos\theta + \sin\theta = \sqrt{2}\cos\theta$  show that  $\cos\theta - \sin\theta = \sqrt{2}\sin\theta$ .

29. if  $l \sec\theta - m \tan\theta + n = 0$  and  $l' \sec\theta - m' \tan\theta + n' = 0$

prove that :  $(m'n - mn')^2 - (n'l - nl')^2 = (l'm - lm')^2$

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