

8. ΔABC is such that $AB = 3$ cm , $BC = 2$ cm and $CA = 2.5$ cm.If $\Delta ABC \sim \Delta DEF$ and $EF = 4$ cm then perimeter of ΔDEF is
- (1) 7.5 cm (2) 15 cm (3) 22.5 cm (4) 30 cm
- 9.If $(5, 7)$, $(3, p)$ and $(6, 6)$ are collinear , then the value of 'p' is
- (1) 3 (2) 6 (3) 9 (4) 12
- 10.The points $A(4, 4)$, $B(3, 5)$, $C(-1, -1)$ form
- (1) right triangle (2) isosceles triangle (3) equilateral triangle (4) None of these
11. $\tan \theta \operatorname{cosec}^2 \theta - \tan \theta$ is equal to
- (1) $\sec \theta$ (2) $\cot^2 \theta$ (3) $\sin \theta$ (4) $\cot \theta$
12. $(1 + \tan \theta + \sec \theta)(1 + \cot \theta - \operatorname{cosec} \theta)$ is equal to
- (1) 0 (2) 1 (3) 2 (4) -1
13. Variance of first 20 natural numbers is
- (1) 32.25 (2) 44.25 (3) 33.25 (4) 30
14. If the mean and coefficient of variation of a data are 4 and 87.5 % , then the standard deviation is
- (1) 3.5 (2) 3 (3) 4.5 (4) 2.5

SECTION –II

Note : Answer 10 questions. Question No. 28 is compulsory.

$10 \times 2 = 20$

15. Define – Onto function
16. Find the value of k , such that $f \circ g = g \circ f$, where $f(x) = 3x + 2$, $g(x) = 6x - k$
17. Use Euclid's Divisions Algorithm to find the HCF of 340 and 412
- 18 Find the number of terms in the A.P 3, 6, 9, 111.
19. Find the sum $1^2 + 2^2 + 3^2 + \dots + 23^2$.
20. Find the LCM of the polynomials $a^2 + 4a - 12$ and $a^2 - 5a + 6$ whose GCD is $a - 2$
21. Write down the quadratic equation whose sum and product of the roots are 9 , 14.
22. Five years ago , father was thrice as old as son. Ten years later , father will be twice as old as son. Find the age of father and son .
23. If ΔABC is similar to ΔDEF such that $BC = 3$ cm , $EF = 4$ cm and area of $\Delta ABC = 54$ cm² . Find the area of ΔDEF

24. Show that the given points are collinear $(-3, -4)$, $(7, 2)$ and $(12, 5)$
25. Find the equation of a straight line perpendicular to the line $y = \frac{4}{3}x - 7$ and passing through the point $(7, -1)$.
26. Prove that $\sec^6 \theta = \tan^6 \theta + 3 \tan^2 \theta \sec^2 \theta + 1$
27. The standard deviation and mean of a data are 6.5 and 12.5 respectively. Find the coefficient of variation.
28. Three vertices of a parallelogram ABCD are $(1, 2)$, $(4, 3)$, $(6, 6)$. Find the 4th vertex.

SECTION – III

Note : Answer 10 questions. Question No . 42 is compulsory.

10 × 5 = 50

29. Let $f: A \rightarrow B$ be a function defined by $f(x) = \frac{x}{2} - 1$, where $A = \{2, 4, 6, 10, 12\}$, $B = \{0, 1, 2, 4, 5, 9\}$
 Represent by (i). set of ordered pairs (ii). a table (iii). an arrow diagram (iv) a graph
30. Find x if $gff(x) = fgg(x)$, given $f(x) = 3x + 1$ and $g(x) = x + 3$
31. Find the sum to n terms of the series $5 + 55 + 555 + \dots$
32. Rekha has 15 square colour papers of sizes 10 cm, 11 cm, 12 cm,24 cm. How much area can be decorated with these colour papers?
33. If the sum of first 7 terms of an A.P is 49 and that of first 17 terms is 289. Find the sum of n terms.
34. If $ax^4 + bx^3 + 361x^2 + 220x + 100$ is a perfect square, find the value of a and b
35. Find the GCD of $6x^3 - 30x^2 + 60x - 48$ and $3x^3 - 12x^2 + 21x - 18$.
36. State and prove Thales theorem.
37. Find the area of the quadrilateral formed by the points $(8, 6)$, $(5, 11)$, $(-5, 12)$ and $(-4, 3)$
38. Find the equation of the median and altitude of ΔABC through A where the vertices are $A(6, 2)$, $B(-5, -2)$ and $C(1, 9)$.
39. If $\frac{\cos \theta}{1 + \sin \theta} = \frac{1}{a}$, then prove that $\frac{a^2 - 1}{a^2 + 1} = \sin \theta$
40. 48 students were asked to write the total number of hours per week they spent on watching television. with this information find the standard deviation of hours spent for watching television.

x	6	7	8	9	10	11	12
f	3	6	9	13	8	5	4

41. Find the coefficient of variation of 24, 26, 33, 37, 29, 31.

42. Find area of the triangle formed by sides $x + 4y - 9 = 0$, $9x + 10y + 23 = 0$, $7x + 2y - 11 = 0$.

SECTION – IV

Note : Answer both questions.

2 × 8 = 16

43.(a) Construct a triangle similar to a given triangle PQR with its sides equal to $\frac{7}{4}$ of the corresponding sides of the triangle PQR. (scale factor $\frac{7}{4} > 1$)

(OR)

(b). Draw a triangle ABC of base BC = 5.6 cm, $\angle A = 40^\circ$ and the bisector of $\angle A$ meets BC at D such that CD = 4 cm

44. (a) Draw the graph of $y = x^2 - 5x - 6$ and hence solve $x^2 - 5x - 14 = 0$

(OR)

(b). Sum of 3 numbers is 10. Sum of the first number, twice the second number and 3 times the third is 29 and the sum of first, four times the second and nine times the third is 43. Find the numbers.