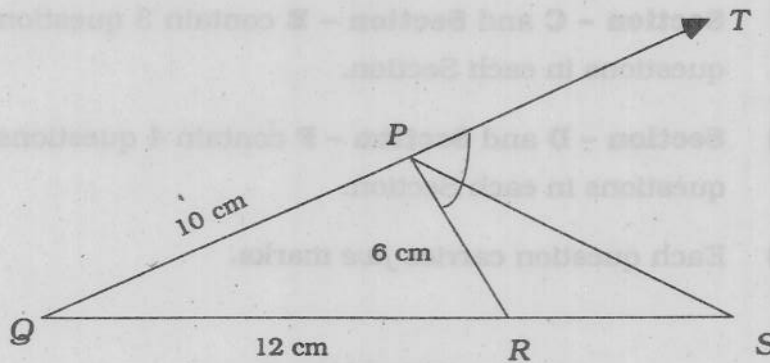


SECTION - B

Answer any ten questions :

10 × 2 = 20

21. Define a scalar matrix with an example.

22. Find p, q, r, s , if $\begin{pmatrix} -2 & p & 4 & 0 \\ 3 & 2 & q & 3 \end{pmatrix} = \begin{pmatrix} -2 & 3 & r & 0 \\ 3 & 2 & 1 & s \end{pmatrix}$.23. The perimeter of two similar triangles ABC and PQR are respectively 36 cm and 48 cm. If $PQ = 16$ cm, find AB .24. AB and CD are two chords of a circle intersecting at E . If E is the mid-point of CD , then prove that $AE \times EB = CE^2$.25. In the given figure, PS is the bisector of the exterior $\angle RPT$ meeting QR produced at S . If $PQ = 10$ cm, $PR = 6$ cm and $QR = 12$ cm, find RS .26. Find the area of the ΔPOQ , given $P(3, 4)$, $Q(7, 8)$ and O is the origin.27. The line joining $A(-4, 6)$ and $B(-1, -3)$ is perpendicular to the line joining $C(0, -4)$ and $D(3, a)$. Find a .28. Find the intercepts cut-off by the line $2x - 3y + 5 = 0$ on the axes.29. Write down the equation of the line perpendicular to $3x + 8y = 12$ and passing through the point $(-1, -2)$.30. Prove that $\frac{\tan^3 \theta - 1}{\tan \theta - 1} = \sec^2 \theta + \tan \theta$.

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31. Verify that $\sin 90^\circ = \sin 60^\circ \cos 30^\circ + \cos 60^\circ \sin 30^\circ$.
32. The angle of elevation of a ladder leaning against a wall is 60° and foot of the ladder is 9.5 cm away from the wall. Find the length of the ladder.
33. If $\sin (A + B) = 2 \sin (A - B) = 1$, find A and B .
34. What is the probability that a number selected from the first 25 natural numbers is a prime number ?
35. The standard deviation of 7 values is 15. If each value is decreased by 8, find standard deviation and variance of the new set of values.

PART - II

- N. B.
- i) This Part contains *four* Sections, **Section - C**, **Section - D**, **Section - E** and **Section - F**.
 - ii) **Section - C** and **Section - E** contain 3 questions. Answer any *two* questions in each Section.
 - iii) **Section - D** and **Section - F** contain 4 questions. Answer any *three* questions in each Section.
 - iv) Each question carries *five* marks.

SECTION - C

Answer any *two* questions :

$2 \times 5 = 10$

36. State Angle Bisector Theorem and prove it.
37. L be a point on the side QR of ΔPQR . If LM and LN are drawn parallel to PR and QP meeting QP , PR at M , N respectively and MN meets produced QR in T , prove that $LT^2 = RT \cdot QT$.
38. Prove that the ratio of the corresponding altitudes of two similar triangles is equal to the ratio of their corresponding sides.

SECTION - D

Answer any three questions :

3 × 5 = 15

39. Prove that $(x \ y) \begin{pmatrix} a & h \\ h & b \end{pmatrix} \begin{pmatrix} x \\ y \end{pmatrix} = (ax^2 + 2hxy + by^2)$.

40. Find X and Y , if $2X + Y = \begin{pmatrix} 4 & 4 & 7 \\ 7 & 3 & 4 \end{pmatrix}$ and $X - 2Y = \begin{pmatrix} -3 & 2 & 1 \\ 1 & 1 & 2 \end{pmatrix}$.

41. Find the variance of the following :

C.I.	20 - 30	30 - 40	40 - 50	50 - 60
f:	8	6	5	4

42. A number is selected at random from 40 to 80. Find the probability that it is divisible by 6 or 9.

SECTION - E

Answer any two questions :

2 × 5 = 10

43. $\frac{1}{\sec A + \tan A} - \frac{1}{\cos A} = \frac{1}{\cos A} - \frac{1}{\sec A - \tan A}$.

44. If $\operatorname{cosec} \phi = \sqrt{2}$, show that $\frac{2 \sin^2 \phi + 3 \cot^2 \phi}{4 (\tan^2 \phi - \cos^2 \phi)} = 2$.

45. From the top of a tree the angle of depression of an object on the horizontal ground is found to be 60° . On descending 20 ft from the top of the tree the angle of depression of the object is found to be 30° . Find the height of the tree.

SECTION - F

Answer any three questions :

3 × 5 = 15

46. Obtain the equation of the straight line passing through the intersection of the lines $x + 3y = 1$ and $x - 2y + 4 = 0$ and parallel to $3x + 4y = 0$.

47. Without using distance formula, show that the points $P(3, 2)$, $Q(0, -1)$, $R(-3, -2)$ and $S(0, 1)$ are the vertices of a parallelogram.

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48. $A(4, 1)$, $B(7, 4)$ and $C(5, -2)$ are the vertices of $\triangle ABC$. Find the equation of the altitude through A .
49. Find the circumcentre of the $\triangle PQR$ whose vertices are $P(5, 3)$, $Q(4, 4)$, $R(4, 2)$.

PART - III

M.B. : i) This Part contains **Section - G**.

ii) Answer any *one* question.

iii) Each question carries *ten* marks.

SECTION - G

Answer any *one* question :

$1 \times 10 = 10$

50. Draw a circle of radius 2 cm. Take a point P at a distance of 4.5 cm from its centre. From P , draw 2 tangents to the circle (using the centre). Calculate the length of the tangents and verify it.
51. Construct a $\triangle PQR$ in which $PQ = 6$ cm, $m\angle R = 50^\circ$ and the median through R is 5.5 cm. Find the length of the altitude from A .