BOARD QUESTION PAPER: JULY 2025

Mathematics Part - II

Time: 2 Hours **Max. Marks: 40**

Note:

i. *All* questions are compulsory.
ii. Use of calculator is not allowed.
iii. The numbers to the right of the questions indicate full marks.
iv. In case of MCQs [Q. No. **1(A)**] only the first attempt will be evaluated and will be given credit.
v. Draw proper figures wherever necessary.
vi. The marks of construction should be clear. Do not erase them.
vii. Diagram is essential for writing the proof of the theorem.

Q.1. (A) Choose the correct alternative from given: **[4]**

i. If $\Delta ABC \sim \Delta DEF$, $m\angle B = 60°$, then $m\angle E =$ _____.

(A) 30° (B) 60°
(C) 90° (D) 45°

ii. Two circles of radii 5.5 cm and 4.2 cm touch each other externally then distance between their centres is _____.

(A) 9.7 cm (B) 1.3 cm
(C) 5.5 cm (D) 4.2 cm

iii. A line makes an angle of 45° with the positive direction of X–axis. So the slope of the line is _____.

(A) $\frac{1}{2}$ (B) $\frac{\sqrt{3}}{2}$
(C) 1 (D) $\sqrt{3}$

iv. The volume of a cube of side 2 cm is _____.

(A) 4 cm^3 (B) 2 cm^3
(C) 6 cm^3 (D) 8 cm^3

(B) Solve the following subquestions: **[4]**

i. Find the diagonal of square whose side is 10 cm.

ii. The ratio of corresponding sides of similar triangles is 3 : 5, then find the ratio of their areas.

iii. Find the slope of the line passing through the points A(2, 3) and B(4, 7).

iv. If $\sin\theta = \frac{7}{25}$, then find the value of $\operatorname{cosec}\theta$.

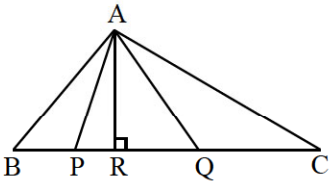
Q.2. (A) Complete the following activities and rewrite it *(any two)*: **[4]**

i. In the given figure, AR ⊥ BC, AR ⊥ PQ, then complete the activity for finding $\frac{A(\Delta ABC)}{A(\Delta APQ)}$.

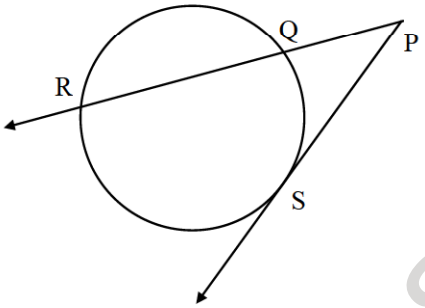
Activity:

$$\frac{A(\Delta ABC)}{A(\Delta APQ)} = \frac{\square}{PQ \times \square} \times AR$$

$$\therefore \frac{A(\Delta ABC)}{A(\Delta APQ)} = \frac{\square}{\square}$$



ii. In the following figure, seg PS is a tangent segment, line PR is a secant. If PQ = 3.6, QR = 6.4, then find PS by completing the following activity.



Activity:

$\therefore$ $PS^2 = PQ \times$ ☐

(tangent secant segments theorem)

$\therefore$ $PS^2 = PQ \times (PQ +$ ☐$)$

$\therefore$ $PS^2 = 3.6 \times (3.6 +$ ☐$)$

$\therefore$ $PS^2 = 3.6 \times 10$

$\therefore$ $PS^2 = 36$

$\therefore$ $PS =$ ☐

iii. Measure of an arc of a circle is 90° and its radius is 14 cm. Complete the following activity to find the length of an arc.

Activity:

Length of an arc $= \frac{\theta}{360} \times$ ☐ …(Formula)

$= \frac{90}{360} \times 2 \times \frac{22}{7} \times$ ☐

$= \frac{1}{4} \times$ ☐

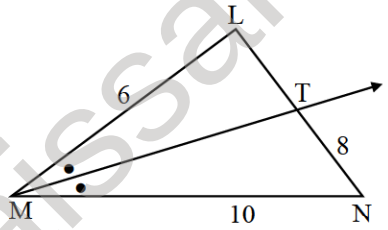
Length of an arc = ☐ cm

(B) Solve the following subquestions *(any four)*: **[8]**

i. In the following figure

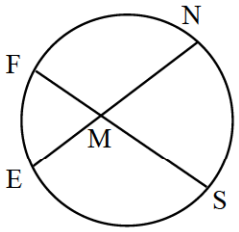
In ΔLMN, ray MT bisects ∠LMN.

If LM = 6, MN = 10, TN = 8, then find LT.



ii. Find surface area of sphere of radius 7 cm.

iii. In the following figure, m(arc NS) = 125°, m (arc EF) = 37°. Find m∠NMS.



iv. Find the co-ordinates of midpoint of the segment joining the points P(22, 20) and Q(0, 16).

v. Find the volume of a cone if radius of its base is 7 cm and its perpendicular height is 15 cm.

Q.3. (A) Complete the following activities and rewrite it *(any one)*: **[3]**

i. If tan θ = 1, then find the value of $\frac{\sin\theta + \cos\theta}{\sec\theta + \operatorname{cosec}\theta}$ by completing the following activity.

Activity:

tan θ = 1 …[Given]

but $\tan$ [ ] $= 1$

$\therefore \quad \theta =$ [ ]

$\therefore \quad \dfrac{\sin\theta+\cos\theta}{\sec\theta+\operatorname{cosec}\theta} = \dfrac{\sin 45°+\cos 45°}{\sec 45°+\operatorname{cosec} 45°}$

$= \dfrac{\dfrac{1}{\square}+\dfrac{1}{\sqrt{2}}}{\sqrt{2}+\square}$

$= \dfrac{\dfrac{2}{\sqrt{2}}}{\square}$

$\dfrac{\sin\theta+\cos\theta}{\sec\theta+\operatorname{cosec}\theta} = \dfrac{1}{\square}$

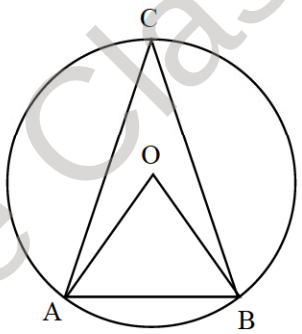
ii. In the following figure, point O is the centre of the circle and length of chord AB is equal to the radius of the circle. Find the measures of:

a. $\angle AOB$

b. arc AB

c. $\angle ACB$

by completing the activity.



Activity:

In ΔAOB,

$AO = OB = AB$

$\therefore$ ΔAOB is an [ ] triangle.

$\therefore$ $m\angle AOB =$ [ ]

$m\angle AOB = m(\text{arc AB}) =$ [ ] (definition of measure of an arc)

$m\angle ACB = \dfrac{1}{2} \times$ [ ] .... [ ]

$= \dfrac{1}{2} \times 60°$

$m\angle ACB =$ [ ]

(B) Solve the following subquestions (any *two*): **[6]**

i. Find co-ordinates of point P, if P divides the line segment joining the points A(−1, 7) and B(4, −3) in the ratio 2 : 3.

ii. Draw a circle with centre O of radius 3.4 cm. Draw a chord MN of length 5.7 cm in it. Construct tangents at point M and N to the circle.

iii. A storm broke a tree and the treetop rested 20 m from the base of the tree, making an angle of 60° with the horizontal. Find the height of the tree.

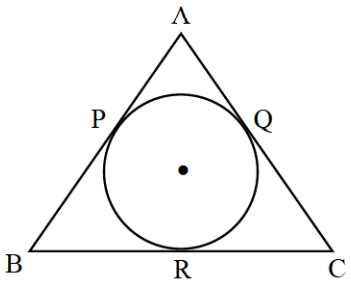
iv. Prove that, 'In a right-angled triangle, the square of the hypotenuse is equal to the sum of the squares of remaining two sides'.

Q.4. Solve the following subquestions (any *two*): **[8]**

i. ΔABC has sides of length 4 cm, 5 cm and 6 cm while ΔPQR has perimeter of 90 cm. If ΔABC is similar to ΔPQR, then find the length of corresponding sides of ΔPQR.

ii. $\Delta ABC \sim \Delta PBR$, BC = 8 cm, AC = 10 cm, $\angle B = 90°$, $\dfrac{BC}{BR} = \dfrac{5}{4}$, then construct ΔPBR.

iii. In the following figure ΔABC is an isosceles triangle with perimeter 44 cm. The base BC is of length 12 cm. Side AB and AC are congruent. A circle touches the three sides of triangle as shown. Find the length of tangent segment from A to circle.



Q.5. Solve the following subquestions (any *one*): **[3]**

i. Draw right-angled ΔABC of lengths of sides are 3 cm, 4 cm and 5 cm.
Draw median on the hypotenuse of ΔABC.
Then:
a. Measure the length of median and write it.
b. By observing lengths of median and hypotenuse write your observations.

ii. Observe the given figure and answer the following questions:
a. How many surfaces does a solid cone have?
b. What are the names of slant height and perpendicular height in the given figure?
c. If slant height of solid cone is 10 cm and perpendicular height is 8 cm, then find diameter of base of solid cone?