

BOARD QUESTION PAPER : MARCH 2015

GEOMETRY

Time: 2 Hours

Max. Marks: 40

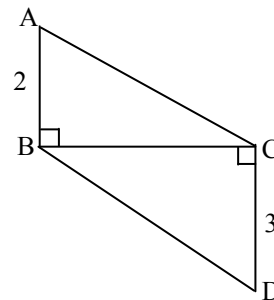
Note:

- i. Solve *All* questions. Draw diagrams wherever necessary.
- ii. Use of calculator is not allowed.
- iii. Figures to the right indicate full marks.
- iv. Marks of constructions should be distinct. They should not be rubbed off.
- v. Diagram is essential for writing the proof of the theorem.

1. Solve any five sub-questions:

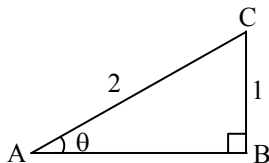
- i. In the following figure, seg AB \perp seg BC, seg DC \perp seg BC.

If AB = 2 and DC = 3, find $\frac{A(\Delta ABC)}{A(\Delta DCB)}$.



[5]

- ii. Find the slope and y-intercept of the line $y = -2x + 3$.
- iii. In the following figure, in ΔABC , BC = 1, AC = 2, $\angle B = 90^\circ$. Find the value of $\sin \theta$.

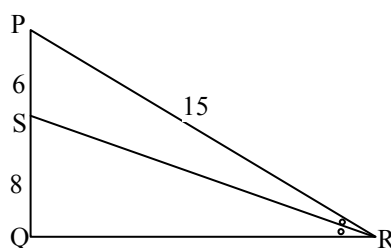


- iv. Find the diagonal of a square whose side is 10 cm.
- v. The volume of a cube is 1000 cm^3 . Find the side of a cube.
- vi. If two circles with radii 5 cm and 3 cm respectively touch internally, find the distance between their centres.

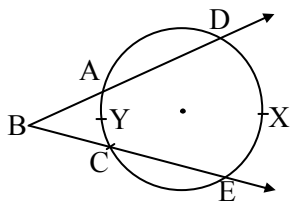
2. Solve any four sub-questions:

[8]

- i. If $\sin \theta = \frac{5}{13}$, where θ is an acute angle, find the value of $\cos \theta$.
- ii. Draw $\angle ABC$ of measure 115° and bisect it.
- iii. Find the slope of the line passing through the points C(3, 5) and D(-2, -3).
- iv. Find the area of the sector whose arc length and radius are 10 cm and 5 cm respectively.
- v. In the following figure, in ΔPQR , seg RS is the bisector of $\angle PRQ$, PS = 6, SQ = 8, PR = 15. Find QR.



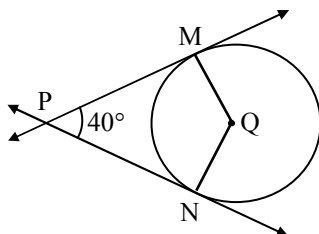
- vi. In the following figure, if $m(\text{arc } DXE) = 100^\circ$ and $m(\text{arc } AYC) = 40^\circ$, find $\angle DBE$.



3. **Solve any three sub-questions:**

[9]

- i. In the following figure, Q is the centre of a circle and PM, PN are tangent segments to the circle. If $\angle MPN = 40^\circ$, find $\angle MQN$.

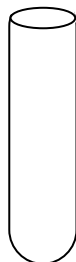


- ii. Draw the tangents to the circle from the point L with radius 2.8 cm. Point, 'L' is at a distance 7 cm from the centre 'M'.
- iii. The ratio of the areas of two triangles with the common base is 6:5. Height of the larger triangle is 9 cm, then find the corresponding height of the smaller triangle.
- iv. Two buildings are in front of each other on either side of a road of width 10 metres. From the top of the first building which is 30 metres high, the angle of elevation to the top of the second is 45° . What is the height of the second building?
- v. Find the volume and surface area of a sphere of radius 4.2 cm. $\left(\pi = \frac{22}{7}\right)$

4. **Solve any two sub-questions:**

[8]

- i. Prove that "the opposite angles of a cyclic quadrilateral are supplementary".
- ii. Prove that $\sin^6 \theta + \cos^6 \theta = 1 - 3 \sin^2 \theta \cdot \cos^2 \theta$.
- iii. A test tube has diameter 20 mm and height is 15 cm. The lower portion is a hemisphere. Find the capacity of the test tube. ($\pi = 3.14$)



5. **Solve any two sub-questions:**

[10]

- i. Prove that the angle bisector of a triangle divides the side opposite to the angle in the ratio of the remaining sides.
- ii. Write down the equation of a line whose slope is $\frac{3}{2}$ and which passes through point P, where P divides the line segment AB joining $A(-2, 6)$ and $B(3, -4)$ in the ratio 2 : 3.
- iii. $\Delta RST \sim \Delta UAY$. In ΔRST , $RS = 6$ cm, $\angle S = 50^\circ$, $ST = 7.5$ cm. The corresponding sides of ΔRST and ΔUAY are in the ratio 5 : 4. Construct ΔUAY .