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.

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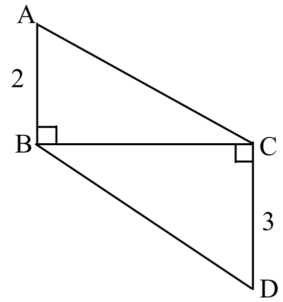
1. Solve any five sub-questions: **[5]**

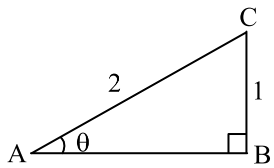
i. In the following figure, seg AB $\perp$ seg BC, seg DC $\perp$ seg BC.

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



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°. Find the value of sin θ.



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]**

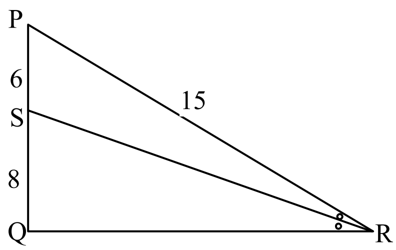
i. If $\sin\theta = \frac{5}{13}$, where θ is an acute angle, find the value of $\cos\theta$.

ii. Draw $\angle$ABC of measure 115° and bisect it.

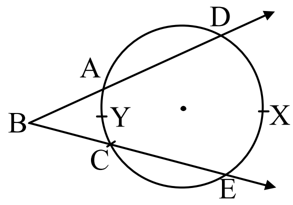
iiii. Find the slope of the line passing through the points C(3, 5) and D(−2, −3).

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.

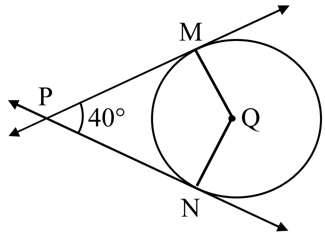


vi. In the following figure, if m(arc DXE) = 100° and m(arc AYC) = 40°, find ∠DBE.



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 ∠MPN = 40°, find ∠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?

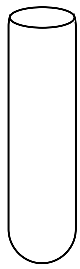
v. Find the volume and surface area of a sphere of radius 4.2 cm. $\left(\pi = \frac{22}{7}\right)$

4. Solve any two sub-questions: **[8]**

i. Prove that "the opposite angles of a cyclic quadrilateral are supplementary".

ii. Prove that $\sin^6\theta + \cos^6\theta = 1 - 3\sin^2\theta.\cos^2\theta$.

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. ΔRST ~ ΔUAY. In ΔRST, RS = 6 cm, ∠S = 50°, ST = 7.5 cm. The corresponding sides of ΔRST and ΔUAY are in the ratio 5 : 4. Construct ΔUAY.