BOARD QUESTION PAPER : MARCH 2016
GEOMETRY

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

Note:

<table>
<tr><td></td><td>**Q.P. SET CODE**</td></tr>
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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.
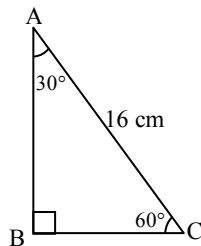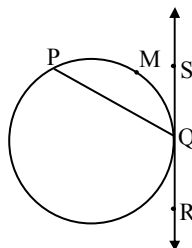v. Diagram is essential for writing the proof of the theorem.

Q.P. SET CODE

C

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

     i. $\Delta DEF \sim \Delta MNK$. If DE = 2, MN = 5, then find the value of $\dfrac{A(\Delta DEF)}{A(\Delta MNK)}$.

     ii. In the following figure, in ΔABC, $\angle B = 90°$, $\angle C = 60°$, $\angle A = 30°$, AC = 16 cm. Find BC.

     iii. In the following figure, m(arc PMQ) = 110°, find $\angle PQS$.
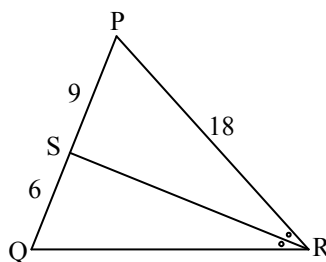

     iv. If the angle $\theta = -30°$, find the value of $\cos\theta$.
     v. Find the slope of the line with inclination 60°.
     vi. Using Euler's formula, find V if E = 10, F = 6.

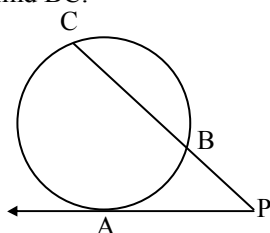**2.** **Solve any four sub-questions:**   **[8]**

     i. In the following figure, in ΔPQR, seg RS is the bisector of $\angle PRQ$. If PS = 9, SQ = 6, PR = 18, find QR.

     ii. In the following figure, a tangent segment PA touching a circle in A and a secant PBC are shown. If AP = 12, BP = 9, find BC.

iii. Draw an equilateral Δ ABC with side 6.4 cm and construct its circumcircle.

iv. For the angle in standard position if the initial arm rotates 130° in anticlockwise direction, then state the quadrant in which terminal arm lies. (Draw the Figure and write the answer.)

v. Find the area of sector whose arc length and radius are 16 cm and 9 cm respectively.

vi. Find the surface area of a sphere of radius 1.4 cm. $\left(\pi = \dfrac{22}{7} \right)$

3. **Solve any three sub-questions:** **[9]**

i. Adjacent sides of a parallelogram are 11 cm and 17 cm. If the length of one of its diagonal is 26 cm, find the length of the other.

ii. In the following figure, secants containing chords RS and PQ of a circle intersects each other in point A in the exterior of a circle. If m(arc PCR) = 26°, m(arc QDS) = 48°, then find:

a.   m ∠ PQR   b.   m ∠ SPQ   c.   m ∠ RAQ
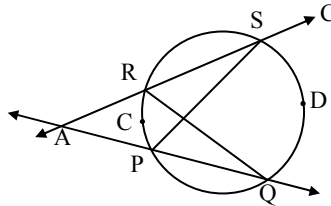
iii. Draw a circle of radius 3.5 cm. Take any point K on it. Draw a tangent to the circle at K without using centre of the circle.

iv. If $\sec \alpha = \dfrac{2}{\sqrt{3}}$, the find the value of $\dfrac{1 - \cos ec\alpha}{1 + \cos ec\alpha}$, where α is in IV quadrant.

v. Write the equation of the line passing through the pair of points (2, 3) and (4, 7) in the form of $y = mx + c$.

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

i. Prove that "The length of the two tangent segments to a circle drawn from an external point are equal".

ii. A person standing on the bank of a river observes that the angle of elevation of the top of a tree standing on the opposite bank is 60°. When he moves 40 m away from the bank, he finds the angle of elevation to be 30°. Find the height of the tree and width of the river. $\left(\sqrt{3} = 1.73 \right)$

iii. A(5, 4), B(–3, –2) and C(1, –8) are the vertices of a triangle ABC. Find the equations of median AD and line parallel to AC passing through the point B.

5. **Solve any two sub-questions:** **[10]**

i. In the following figure, AE = EF = AF = BE = CF = a, AT ⊥ BC. Show that AB = AC = $\sqrt{3} \times a$
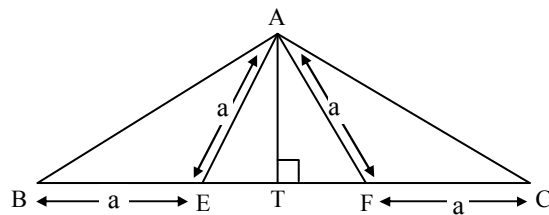
ii. Δ SHR ~ Δ SVU. In Δ SHR, SH = 4.5 cm, HR = 5.2 cm, SR = 5.8 cm and $\dfrac{SH}{SV} = \dfrac{3}{5}$. Construct Δ SVU.

iii. Water flows at the rate of 15m per minute through a cylindrical pipe, having the diameter 20 mm. How much time will it take to fill a conical vessel of base diameter 40 cm and depth 45 cm?