

# BOARD QUESTION PAPER : MARCH 2016

## 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.

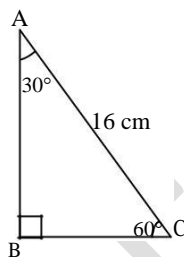
**Q.P. SET CODE**

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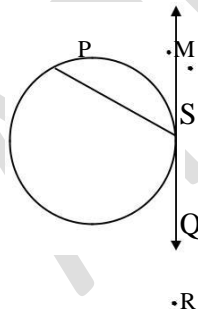
**1. Solve any five sub-questions:**

[5]

- i.  $\triangle DEF \sim \triangle MNK$ . If  $DE = 2$ ,  $MN = 5$ , then find the value of  $\frac{A(\square DEF)}{A(\square MNK)}$ .
- ii. In the following figure, in  $\triangle ABC$ ,  $\angle B = 90^\circ$ ,  $\angle C = 60^\circ$ ,  $\angle A = 30^\circ$ ,  $AC = 16$  cm. Find  $BC$ .



- iii. In the following figure,  $m(\text{arc PMQ}) = 110^\circ$ , find  $\angle PQS$ .

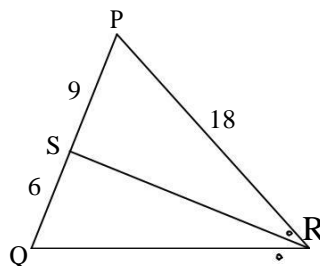


- iv. If the angle  $\theta = -30^\circ$ , find the value of  $\cos \theta$ .
- v. Find the slope of the line with inclination  $60^\circ$ .
- vi. Using Euler's formula, find  $V$  if  $E = 10$ ,  $F = 6$ .

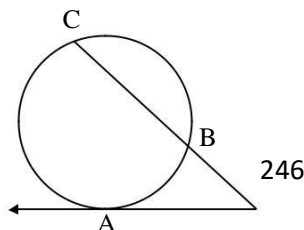
**2. Solve any four sub-questions:**

[8]

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



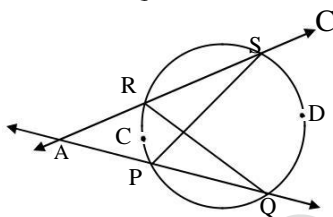
- ii. In the following figure, a tangent segment  $PA$  touching a circle in  $A$  and a secant  $PBC$  are shown. If  $AP = 12$ ,  $BP = 9$ , find  $BC$ .



- iii. Draw an equilateral  $\Delta ABC$  with side 6.4 cm and construct its circumcircle.
- iv. For the angle in standard position if the initial arm rotates  $130^\circ$  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.  $\pi = \frac{22}{7}$

**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  $m(\text{arc PCR}) = 26^\circ$ ,  $m(\text{arc QDS}) = 48^\circ$ , then find:
  - a.  $m \angle PQR$
  - b.  $m \angle SPQ$
  - c.  $m \angle RAQ$



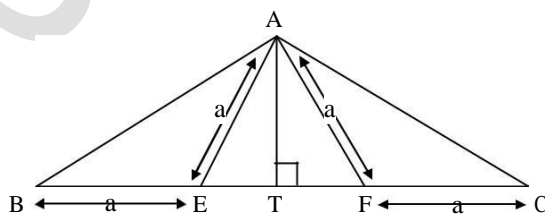
- iii. Draw a circle of radius 3.5 cm. Take any point K on it. Draw a tangent to the circle at K without using centre of the circle.
- iv. If  $\sec \alpha = \frac{2}{\sqrt{3}}$ , the find the value of  $\frac{1 - \operatorname{cosec} \alpha}{1 + \operatorname{cosec} \alpha}$ , where  $\alpha$  is in 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  $60^\circ$ . When he moves 40 m away from the bank, he finds the angle of elevation to be  $30^\circ$ . Find the height of the tree and width of the river. ( $\sqrt{3} = 1.73$ )
- 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,  $AE = EF = AF = BE = CF = a$ ,  $AT \perp BC$ . Show that  $AB = AC = \sqrt{3} \times a$



- ii.  $\Delta SHR \sim \Delta SVU$ . In  $\Delta SHR$ ,  $SH = 4.5$  cm,  $HR = 5.2$  cm,  $SR = 5.8$  cm and  $\frac{SH}{SV} = \frac{3}{5}$  -

Construct  $\Delta SVU$ .

- 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?