



# BOARD QUESTION PAPER : JULY 2017

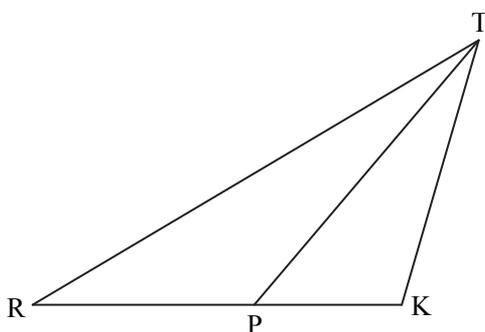
## GEOMETRY

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

- Solve *All* questions. Draw diagrams wherever necessary.
- Use of calculator is not allowed.
- Diagram is essential for writing the proof of the theorem.
- Marks of constructions should be distinct. They should not be rubbed off.

**Q.P. SET CODE****B****1. Solve any five sub-questions:****[5]**

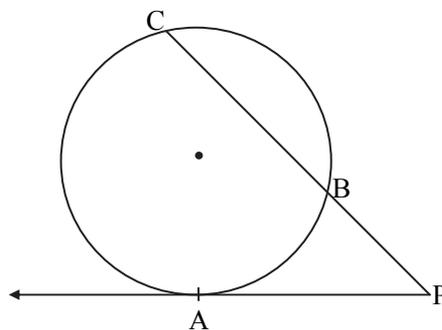
- In the following figure  $RP : PK = 3 : 2$ , then find the value of  $A(\Delta TRP) : A(\Delta TPK)$ .



- If two circles with radii 8 and 3 respectively touch externally, then find the distance between their centres.
- If the angle  $\theta = -60^\circ$ , find the value of  $\cos \theta$ .
- Find the slope of the line having inclination  $45^\circ$ .
- Find the side of the square whose diagonal is  $16\sqrt{2}$  cm.
- Find the volume of a cube with side 6 cm.

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

- Sides of a triangle are 7, 24 and 25. Determine whether the triangle is right-angled triangle or not.
- The diameter of a sphere is 6 cm. Find the total surface area of the sphere. ( $\pi = 3.14$ )
- Draw a tangent at any point 'M' on the circle of radius 3.3 cm and centre 'O'.
- If  $\sin \theta = \frac{8}{17}$ , where  $\theta$  is an acute angle, find the value of  $\cos \theta$  by using identities.
- Find the area of the sector of a circle of radius 8 cm and arc with length 15 cm.
- In the given figure, a tangent segment PA touching a circle in A and a secant PBC are shown. If  $AP = 15$  cm and  $BP = 10$  cm, find the length of PC.

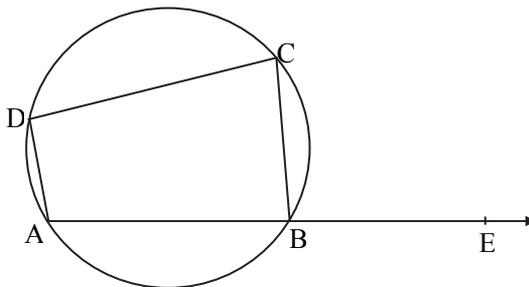




## 3. Solve any three sub-questions:

[9]

- i. In  $\Delta PQR$ ,  $\angle P = 30^\circ$ ,  $\angle Q = 60^\circ$ ,  $\angle R = 90^\circ$  and  $PQ = 12$  cm, then find  $PR$  and  $QR$ .
- ii.  $\square ABCD$  is a cyclic quadrilateral.  $m(\text{arc } ABC) = 230^\circ$ . Find  $\angle ABC$ ,  $\angle CDA$  and  $\angle CBE$ .



- iii. Draw the circumcircle of  $\Delta PMT$  in which  $PM = 5.6$  cm,  $\angle P = 60^\circ$ ,  $\angle M = 70^\circ$ .
- iv. Prove that:  $\sec^2 \theta + \operatorname{cosec}^2 \theta = \sec^2 \theta \times \operatorname{cosec}^2 \theta$ .
- v. Find the equation of the line passing through the points  $(4, -5)$  and  $(-1, -2)$ .

## 4. Solve any two sub-questions:

[8]

- i. Prove that, "The lengths 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 the width of the river. ( $\sqrt{3} = 1.73$ )
- iii. If  $P(-2, 4)$ ,  $Q(4, 8)$ ,  $R(10, 5)$  and  $S(4, 1)$  are the vertices of a quadrilateral, show that it is a parallelogram.

## 5. Solve any two sub-questions:

[10]

- i. Prove that "The ratio of areas of two similar triangles is equal to the square of the ratio of their corresponding sides."
- ii. Draw a triangle  $ABC$  with side  $BC = 6$  cm,  $\angle B = 45^\circ$  and  $\angle A = 100^\circ$ , then construct a triangle  $PBQ$  whose sides are  $\frac{7}{4}$  times the corresponding sides of  $\Delta ABC$ .
- iii. A tin maker converts a cubical metallic box into 10 cylindrical tins. Side of the cube is 50 cm and radius of the cylinder is 7 cm. Find the height of each cylinder so made, if the wastage of 12% is incurred in the process.  $\left(\pi = \frac{22}{7}\right)$