

Date : 28/3/2008

# GEOMETRY - PAPER II

Time : 3 Hours )

## Question Paper - March 2008

( Max. Marks : 60

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

### Q. 1. Solve any six sub-questions :

(12)

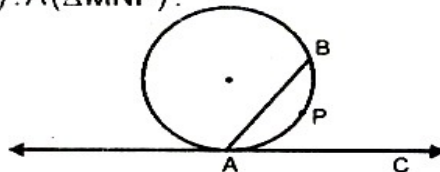
- (i) Find the side of the square whose diagonal is 16 cm.  
(ii) The height of a right circular cylinder is 15 cm and the radius is 6 cm. Find the curved surface area. (Given  $\pi = 3.14$ )

(iii)  $\Delta ABC \sim \Delta MNP$  and  $BC : NP = 3 : 4$ , then find  $A(\Delta ABC) : A(\Delta MNP)$ .

(iv) In the figure given below, seg AB is a chord of the circle.

C be a point on tangent to the circle at point A.

If  $m(\text{arc APB}) = 60^\circ$ , then find  $m\angle BAC$ .



(v) Two circles with diameters 26 cm and 14 cm touch each other internally ?

(Find the distance between their centres.)

(iv) Draw seg.  $PQ = 7.5$  cm and bisect it, using perpendicular bisector .

(vii) Find the distance between the points A (- 4, 6), B ( 2, -2).

(viii) Find the value of  $\frac{\tan 43}{\cot 47}$ .

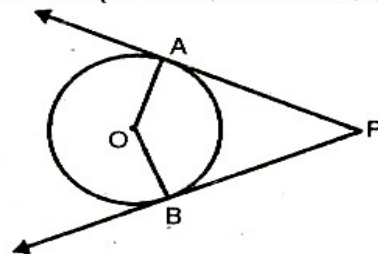
### Q. 2. Solve any four sub-questions :

(12)

(i) Find curved surface area and total surface area of a hemisphere with radius 6 cm. ( $\pi = 3.14$ )

(ii) Draw the incircle of an equilateral triangle ABC with side 5.8 cm: (Do not write construction).

(iii) In the figure given below, angle between two radii of a circle is of  $120^\circ$ . Tangents to the circle are drawn at the outer ends of these radii. Find the measure of the angle between the tangents.



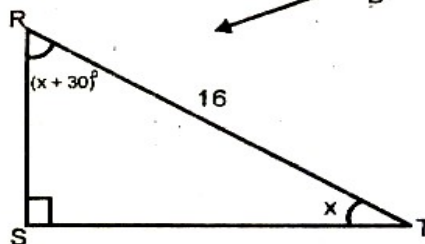
(iv) Show that  $\tan 25^\circ \cdot \tan 50^\circ \cdot \tan 40^\circ \cdot \tan 65^\circ = 1$ .

(v) In the figure given below,

$\angle S = 90^\circ$ ,  $\angle T = x^\circ$ ,  $\angle R = (x + 30)^\circ$ ,  $RT = 16$ .

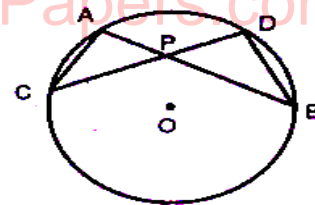
Find :

(1) RS; and (2) ST.



- (vi) In the figure given below chords AB and CD intersect each other internally at P. Prove that :

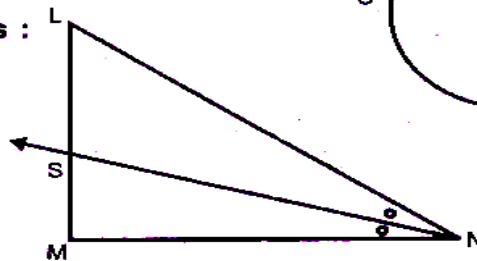
$$AP \times PB = CP \times PD$$



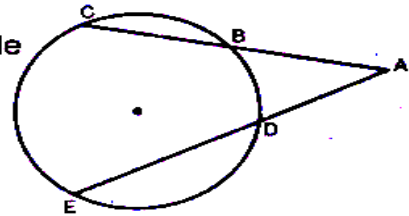
(12)

Q. 3. Solve any four sub-questions :

- (i) In the figure given below, ray NS is a bisector of  $\angle LNM$  in  $\triangle LMN$ .  
 $LS = 9$ ,  $SM = 6$ ,  $MN = 14$ .  
 Find LN.



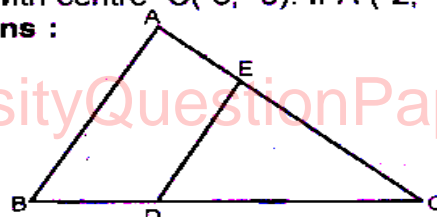
- (ii) In  $\triangle ABC$ ,  $\angle ABC = 90^\circ$ ,  $AB = 12$ ,  $BC = 16$  and seg BP is a median. Find BP.  
 (iii) Find the length of the tangent segments from a point which is at a distance of 5 cm from the centre of the circle of radius 3 cm.  
 (iv) In the figure given below, point B, C, D and E lie on a circle such that lines CB and ED intersect each other in point A in the exterior of the circle. If  $CB = 5$ ,  $AB = 20$  and if ED exceeds AD, determine ED - AD.



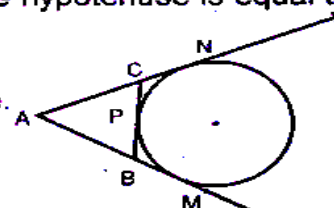
- (v) Prove that :  $\sqrt{\frac{1 + \cos A}{1 - \cos A}} = \operatorname{cosec} A + \cot A$ .

Q. 4. Solve any three sub-questions :  
 (vi) AB is the diameter of a circle with centre C(-3, -5). If A(-2, 4), find the co-ordinates of B. (12)

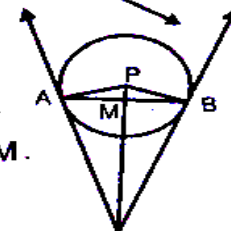
- (i) In the figure given below :  
 seg DE  $\parallel$  side AB,  $DC = 2 BD$ ,  
 $A(\triangle CDE) = 20 \text{ cm}^2$ ,  
 then find A ( $\square ABDE$ ).



- (ii) Prove : In a right angled triangle, the square of the hypotenuse is equal to the sum of the squares of remaining two sides.  
 (iii) In the figure given below, A circle touches side BC of the  $\triangle ABC$  from outside of the triangle. Further extended lines AC and AB are tangents to the circle at N and M respectively. Prove that  $AM = \frac{1}{2}$  (Perimeter of  $\triangle ABC$ ).



- (iv) In the figure given below, AB is the chord of a circle with centre P. Tangents at points A and B intersect at point C. Seg PC intersects chord AB in M. Prove that  $AM^2 = PM \times CM$ .



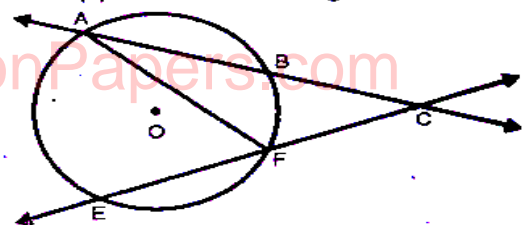
- (v) Construct  $\triangle PQR$  such that  $PR = 8.8 \text{ cm}$ ,  $\angle PQR = 110^\circ$ .  
 seg QT is the median and  $QT = 3.6 \text{ cm}$  (Do not write construction).  
 (vi) The outer dimensions of a household fish aquarium in cm are  $60.4 \times 40.4 \times 40.2$ . If the thickness of the glass used to make it is 2mm, find the quantity of water that the aquarium will hold in litres.

Q. 5. Solve any three sub-questions :

(12)

- (i) Prove : In a triangle, the angle bisector divides the side opposite to the angle in the ratio of the remaining sides.  
 (ii) In the figure given below, in a circle with centre O, secants AB and EF intersect each other at point C in exterior of the circle.

Prove that  $m\angle ACE = \frac{1}{2} [m(\text{arc } AE) - m(\text{arc } BF)]$ .



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- (iii) Draw a circle with radius 2.6 cm. Find the positions of points P, Q, R on the circle such that the tangent segments drawn at P, Q and R determine an equilateral triangle. (Do not write construction)
- (iv) A flagstaff stands on the top of a 5 metres high tower. From a point on the ground, the angle of elevation of the top of the flagstaff is  $60^\circ$  and from the same point, the angle of elevation of the top of the tower is  $45^\circ$ . Find the height of the flagstaff.
- (v) "5 Rs" coins were made by melting a solid cuboidal block of metal with dimensions  $16 \times 11 \times 10$  in cm. How many coins of thickness 2mm and diameter 2cm can be made ?  
(Given  $\pi = \frac{22}{7}$ )
- (vi) Show that the points A(4, 7), B(8, 4), C(7, 11) are the vertices of a right-angled triangle.  $\square\square$
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