

THE O.P. GUPTA

ADVANCED MATH CLASSES

Mathematics (Standard & Basic)

Topic - Areas Related to Circles

RTS-11



FOR ANSWERS

RANKERS

TEST SERIES FOR X

Max. Marks - 40

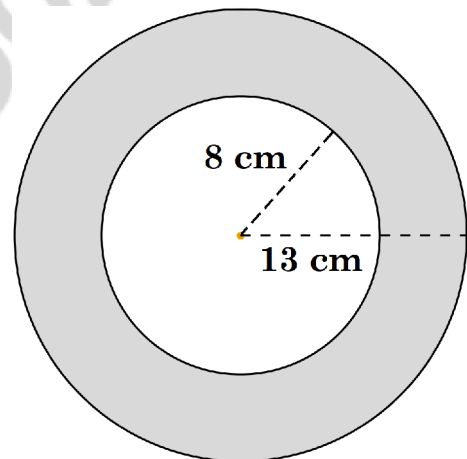
Time - 90 Minutes

SECTION A

Followings multiple choice questions are of **1 Mark** each (Q01-10).

Select the correct option in each one of them.

- Q01. The ratio of the areas of two circles is 9 : 16. The ratio of their circumferences will be
(A) 3 : 4 (B) 9 : 16 (C) 81 : 256 (D) 4 : 3
- Q02. The area of a sector of a circle of radius r is $\frac{\pi r^2}{4}$. The angle of the sector is
(A) 60° (B) 90° (C) 120° (D) 180°
- Q03. If the perimeter of a semicircular protractor is 72 cm, then its diameter is
(A) 18 cm (B) 24 cm (C) 28 cm (D) 48 cm
[Use $\pi = \frac{22}{7}$]
- Q04. The difference between the circumference and the diameter of a circle is 30 cm. The radius of the circle is
(A) 14 cm (B) 7 cm (C) 21 cm (D) 28 cm
- Q05. A horse is tied to a peg at one corner of a square-shaped grass field of side 15 m by a rope 5 m long. The area of the field in which the horse can graze is
(A) $\frac{25\pi}{4} \text{ m}^2$ (B) $75\pi \text{ m}^2$ (C) $100\pi \text{ m}^2$ (D) $225\pi \text{ m}^2$
- Q06. A chord of a circle of radius 10 cm subtends a right angle at the center. The area (in cm^2) of the minor segment is
(A) $25\pi - 50$ (B) $50\pi - 100$ (C) $75\pi - 50$ (D) $100\pi - 100$
- Q07. The wheel of a car makes 1000 revolutions. If the diameter of the wheel is 84 cm, the distance covered is
(A) 2.64 km (B) 2.44 km (C) 2.64 m (D) 26.4 km
- Q08. The radii of two concentric circles are 13 cm and 8 cm as shown below.
The area of the ring (shaded region) between them is
(A) $69\pi \text{ cm}^2$ (B) $105\pi \text{ cm}^2$
(C) $169\pi \text{ cm}^2$ (D) $225\pi \text{ cm}^2$



Followings are **Assertion-Reason based questions** (Q09 & 10).

In the following questions, a statement of Assertion (A) is followed by a statement of Reason (R).

Choose the correct answer out of the following choices.

- (A) Both A and R are true and R is the correct explanation of A.
(B) Both A and R are true and R is not the correct explanation of A.
(C) A is true but R is false.
(D) A is false but R is true.
- Q09. **Assertion (A)** : The diameter of a wheel is 1.4 m. To cover 1.1 km, the wheel shall make exactly 250 revolutions, if $\pi = \frac{22}{7}$.

Reason (R) : Circumference of a circle $= \pi \left(\frac{d}{2} \right)$, where d is the diameter.

- Q10. **Assertion (A) :** A circular park has a path running around it of width 7 m. If the outer radius of the park is 21 m, the area of the path is 770 m^2 .

Reason (R) : The area of a segment of a circle is obtained by subtracting the area of the corresponding triangle from the area of the sector i.e., Area of segment = Area of sector – Area of triangle.

[1×10 = 10]

SECTION B

Followings are of **2 Marks** each (Q11-12).

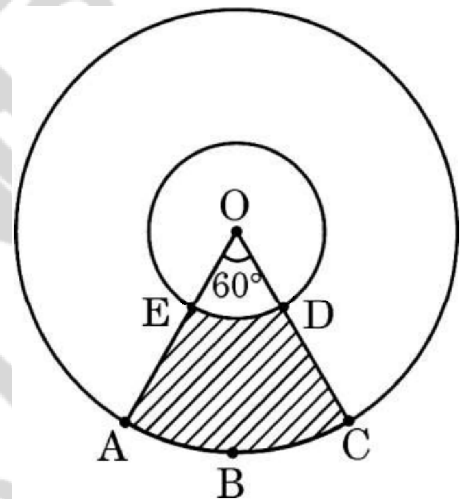
- Q11. In a circle of radius 21 cm, an arc subtends an angle of 60° at the centre. Find the area of the sector formed by the arc. Also, find the length of the arc.
- Q12. (a) A horse is tied to a peg at one corner of a square shaped grass field of side 15 m by means of a 5 m long rope. Find the area of that part of the field in which the horse can graze. Also, find the increase in grazing area if length of rope is increased to 10 m. (Use $\pi = 3.14$).

OR

(b) In the given figure, two concentric circles with centre O are shown.

Radii of the circles are 2 cm and 5 cm respectively.

Find the area of the shaded region.



[2×2 = 4]

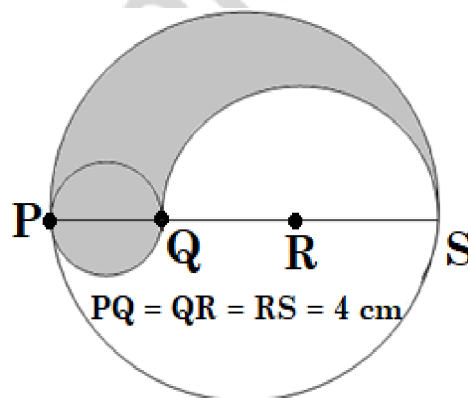
SECTION C

Followings are of **3 Marks** each (Q13-16).

- Q13. (a) Find the area of the sector of a circle of radius 7 cm and of central angle 90° . Also, find the area of corresponding major sector.

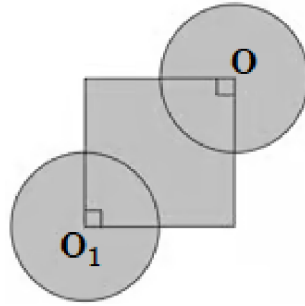
OR

(b) In the given figure, find the area of shaded region.



- Q14. A chord of a circle of radius 14 cm subtends an angle of 60° at the centre. Find the area of the corresponding minor segment of the circle. Also find the area of the major segment of the circle.
- Q15. Two circles touch each other externally and the sum of their areas is $52\pi \text{ cm}^2$. If the distance between the centers of two circles is 10 cm, find their radii.

- Q16. In the given figure, the side of square is 28 cm and radius of each circle is half of the length of the side of the square where O and O_1 are centers of the circles. Find the area of shaded region.

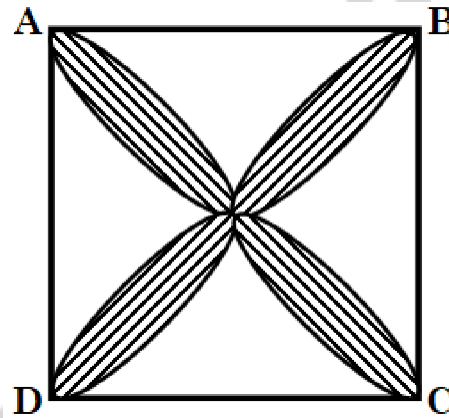


[$3 \times 4 = 12$]

SECTION D

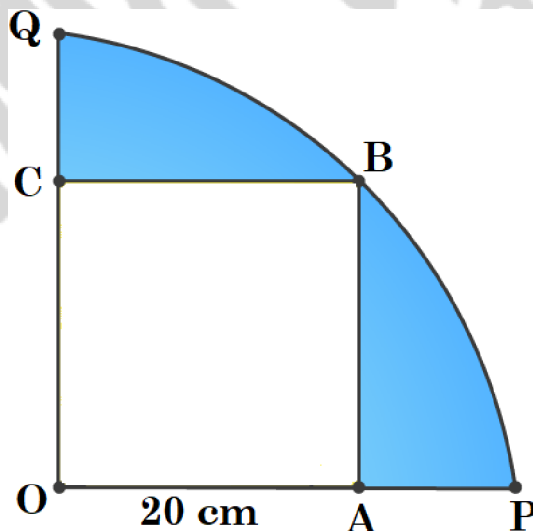
Followings are of **5 Marks** each (Q17-18).

- Q17. (a) Find the area of the shaded design as shown in the figure, where ABCD is a square of side 12 cm and semi circles are drawn with each side of square as diameter. Use $\pi = 3.14$.



OR

- (b) In the given figure, a square OABC has been inscribed in the quadrant OPBQ. If $OA = 20$ cm, then find the area of the shaded region. Use $\pi = 3.14$.



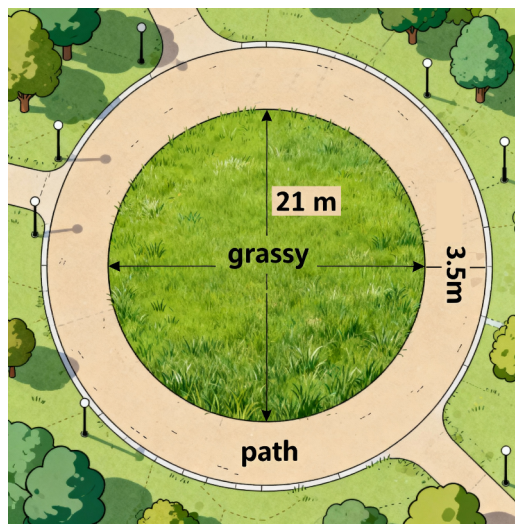
- Q18. An athletic track, 14 m wide, consists of two straight sections 120 m long joining semicircular ends whose inner radius is 35 m. Calculate the area of track.

[$5 \times 2 = 10$]

SECTION E

Following is a case-study based question of **4 Marks** (Q19); having three sub-parts (i), (ii) and (iii).

- Q19. **CASE STUDY BASED QUESTION :** A circular park has a radius of 21 m. A concrete path of width 3.5 m is built around the park along its boundary. Many children from nearby localities play inside the grassy part of the park (without the path).



Based on the above information, answer the following questions using $\pi = \frac{22}{7}$.

- (i) Find the area of the grassy part (without the path).
- (ii) Find the area of the concrete path.
- (iii) If the path is to be covered with tiles costing ₹120 per m^2 , find the total cost.

OR

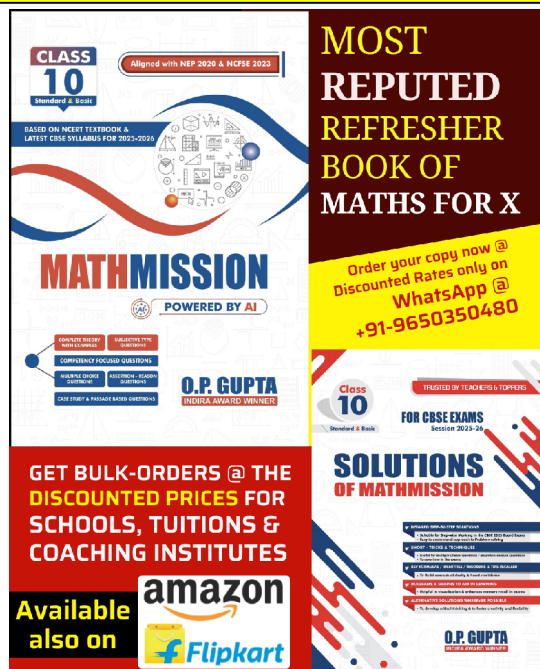
- (iii) If a circular fountain of radius 3.5 m is built at the centre of the grassy part, find the remaining area of grass.

[1+1+2 = 4]

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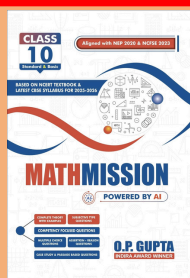
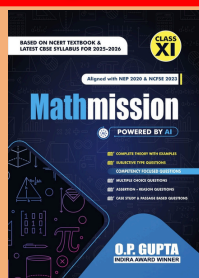
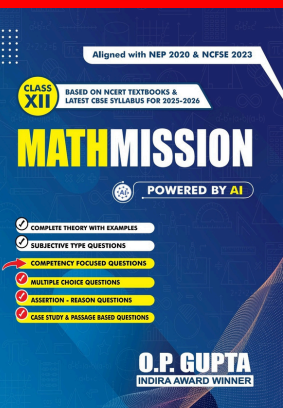
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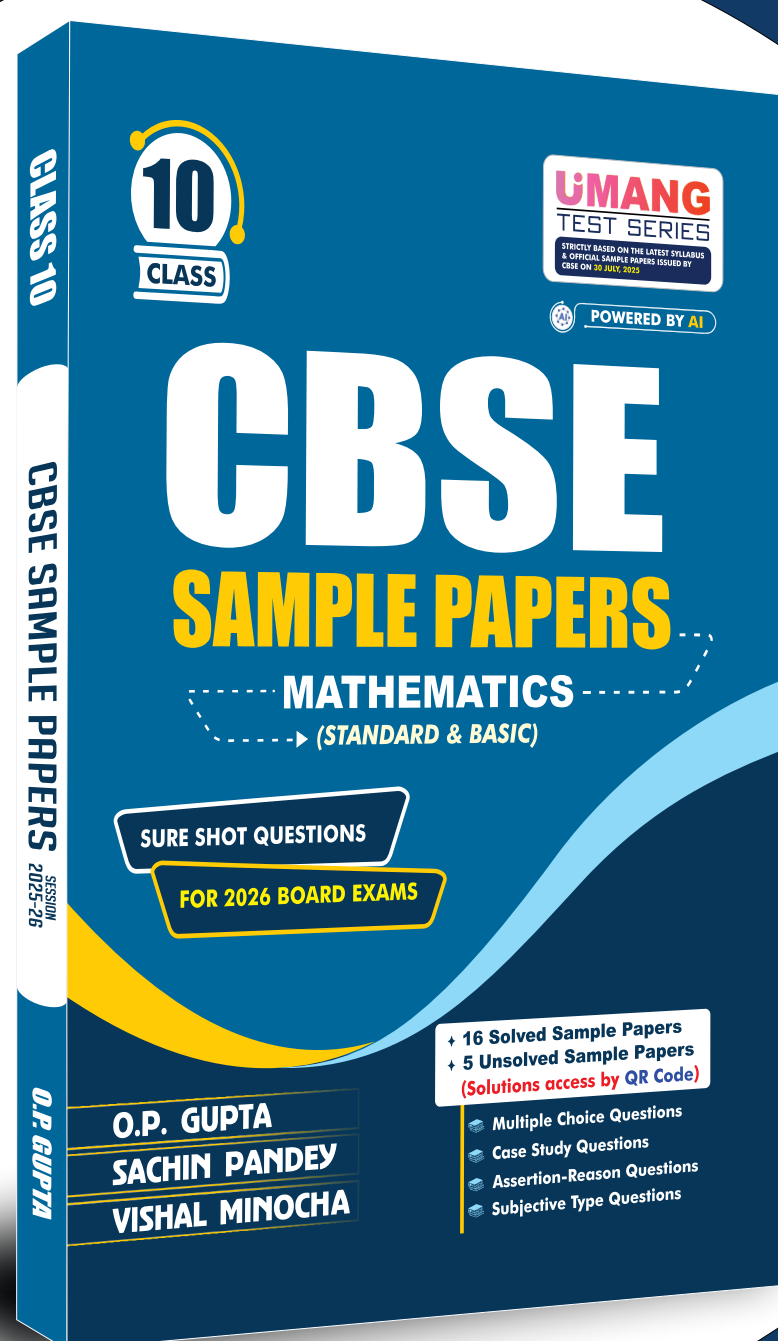
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