INFINITY THINK BEYOND.....

AN EDUCATIONAL INSTITUTE

SUBJECT: MATHS **MAX. MARKS : 30**

DATE : 15/11/24 **DURATION : 60 MIN**

PBMT - 01

UNIT – MENSURATION

Ch-11 Area related to circles

Ch -12 surface area & volume

General Instruction:

This Question Paper has 5 Sections A-E.

1. **Section A** has 6 MCQs carrying 1 mark each.
2. **Section B** has 2 questions carrying 02 marks each.
3. **Section C** has 2 questions carrying 03 marks each.
4. **Section D** has 1 questions carrying 04 marks each.
5. **Section E** has 2 questions carrying 05 marks each .

Draw neat figures wherever required. Take π =22/7 wherever required if not stated.

SECTION – A

Questions 1 to 6 carry 1 mark each.

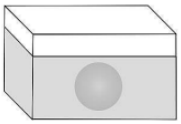
1. The area of a square that can be inscribed in a circle of radius 6 cm is:

(a) 36 cm^2 (b) 72 cm^2 (c) 18 cm^2 (d) $36\sqrt{2}$ cm^2

2. The number of spherical balls each of radius 1cm can be made from a solid sphere of lead of radius 6cm is

(a) 576 (b) 512 (c) 216 (d) 1024

3. A cuboid of base area P sq units is filled with water upto a height of Q units. A sphere of volume R cu units is dropped into the cuboid such that it is completely submerged. A representation of the submerged sphere is shown below.



Which of these represents the increase in the height of water?

(a) 0 units (b) $\frac{R}{P}$ units (c) R units (d) $Q + \frac{R}{P}$ $units$

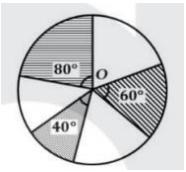
4. A solid is in the shape of a cone standing on a hemisphere with both their radii being equal to 1cm and the height of the cone is equal to its radius. The volume of the solid is

(a) π cm^3 (b) 4π cm^3 (c) 2π cm^3 (d)$3\ \pi$ cm^3

5. The circumference of a circle is 22 cm. The area of its quadrant (in cm^2) is

(a) $\frac{77}{2}$ (b) $\frac{77}{4}$ (c) $\frac{77}{8}$ (d) $\frac{77}{16}$

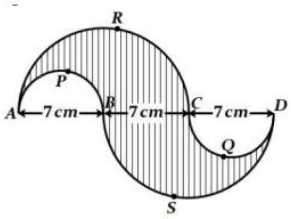
6. In figure, three sectors of a circle of radius 7 cm, making angles of 60°, 80°, 40° at the centre are shaded. The area of the shaded region (in cm^2) is $\left[use\ \pi = \frac{22}{7}\right]$



(a) 77 (b) 154 (c) 44 (d) 22

SECTION – B
Questions 7 to 8 carry 2 mark each.

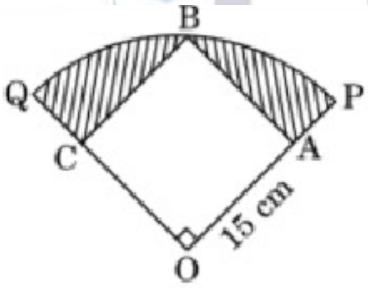
7. In figure, APB and CQD are semi-circles of diameter 7 cm each, while ARC and BSD are semi-circles of diameter 14 cm each. Find the perimeter of the shaded 6region. $\left[use\ \pi = \frac{22}{7}\right]$.



OR

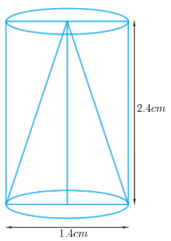
How many spherical lead shots of diameter 4 cm can be made out of a solid cube of lead whose edge measures 44 cm?

8. In the adjoining fig. a square OABC is inscribed in a quadrant OPBQ .If OA = 15 cm , find the area of the shaded region .($\pi = 3.14$)



SECTION – C
Questions 9 to 10 carry 3 mark each.

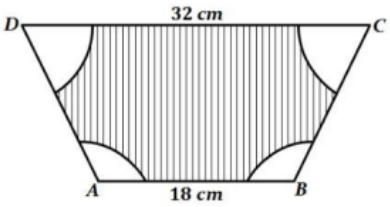
9. From a solid cylinder whose height is 2.4 cm and diameter 1.4 cm, a conical cavity of the same height and same diameter is hollowed out. Find the total surface area of the remaining solid to the nearest cm ^{2} .



10. Water is being pumped out through a circular pipe whose internal diameter is 7 cm. If the flow of water is 72 cm per second, how many litres of water are being pumped out in one hour.

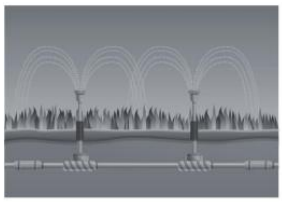
OR

In the given figure, $ABCD$ is a trapezium with $AB \parallel DC$,AB = 18 cm, DC = 32 cm and the distance between AB and DC is 14 cm. If arcs of equal radii 7 cm taking A, B, C and D as centres, have been drawn, then find the area of the shaded region.

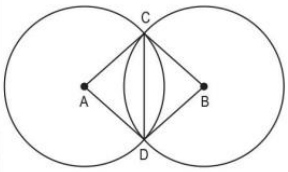


SECTION – D
Questions 11 carry 4 mark each.

11. Sprinklers are crop irrigation equipment which rotate around a centre and spray water on the crops in the circular region. Two such high power sprinklers, occupying negligible area are installed in a straight line in a field such that they spray water on a common area. Shown below are the side and top views where points A and B are the sprinklers.



Side view of the sprinklers



Top view of the region sprayed

Both the sprinklers spray over an equal area. It is given that, CD = 400 m and ∠CAD = ∠CBD = 90°.

(i) Find the radius of the circular region sprayed by the sprinkler.

(ii) Find the perimeter of the region sprayed by both the sprinklers. (Use π = 3.14)

(iii) Find the area of the overlapping region. (Use π = 3.14)

OR

(iii) Find the total area of the major sectors with centres at A and B.

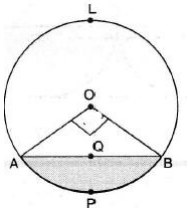
SECTION – E
Questions 12 to 13 carry 5 mark each

12.A well of diameter 4m is dug 14 m deep. The earth taken out is spread evenly all around the well to form a 40 cm high embankment. Find the width of the embankment.

OR

Water flows through a cylindrical pipe, whose inner radius is 1 cm, at the rate of 80cm/ sec in an empty cylindrical tank, the radius of whose base is 40 cm. What is the rise of water level in tank in half an hour ?

13. A Chord AB of a circle , with centre O and radius 10 cm , subtends a 120^0 at the centre of the circle. Find the area of the minor segment AQBP. Hence find the area of major segment ALBQA. (Use π = 3.14)



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