# CLASS-X (MATHS) CBT SYLLABUS   NOVEMBER-2024

- **AREA RELATED TO CIRCLES**
- **SURFACE AREA AND VOLUMES**

Case Study 1:-

A brooch is made with silver wire in the form of a circle with diameter 35 mm. The wire is also used in making 5 diameters which divide the circle into 10 equal sectors as shown in the following figure. Using the above information answer the following questions:

(1) The circumference of the brooch is

    (A) 100 mm

    (B) 120 mm

    (C) 110 mm

    (D) 95 mm
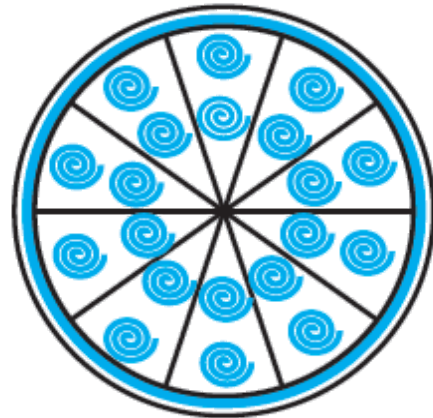
(2) The area of the brooch is

    (A) 962.5 mm^2

    (B) 926.5 mm^2

    (C) 960.5 mm^2

    (D) 956.5 mm^2

(3) The total length of the silver wire used in making the brooch is

    (A) 258 mm

    (B) 285 mm

    (C) 185 mm

    (D) 385 mm

(4) The area of each sector of brooch is

    (A) 69.25 mm^2

    (B) 92.65 mm^2

    (C) 86.25 mm^2

    (D) 96.25 mm^2

(5) The sector angle of each sector of the brooch is

    (A) 60°

    (B) 18°

    (C) 36°

    (D) 30°

ANSWER:

(1) (C) 110 mm

C.F.= $2 \times \frac{22}{7} \times \frac{35}{2}$ = 110 mm

(2) (A) 962.5 mm^2

Area of brooch = $\frac{22}{7} \times \frac{35}{2} \times \frac{35}{2}$ = 962.5 mm²

(3) (B) 285 mm

Length of wire = C.F.+5 $\times Diameter$ = 110 + 5 $\times$35 = 285 mm

(4) (D) 96.25 mm²

Area of each sector = $\frac{Area\ of\ brooch}{number\ of\ sectors}$ = $\frac{962.5}{10}$ = 96.25

(5) (C) 36°

sector angle of each sector of the brooch= $\frac{360^0}{number\ of\ sectors}$ = $\frac{360°}{10}$ = 36°

Case Study 2:-

A student made a wooden pen stand which is in the shape of a cuboid with four conical depressions to hold pens. The dimensions of the cuboid are 15 cm by 10 cm by 3.5 cm. The radius of each of the depressions is 0.5 cm and the depth is 1.4 cm. Find the volume of wood in the entire stand (see the below figure).
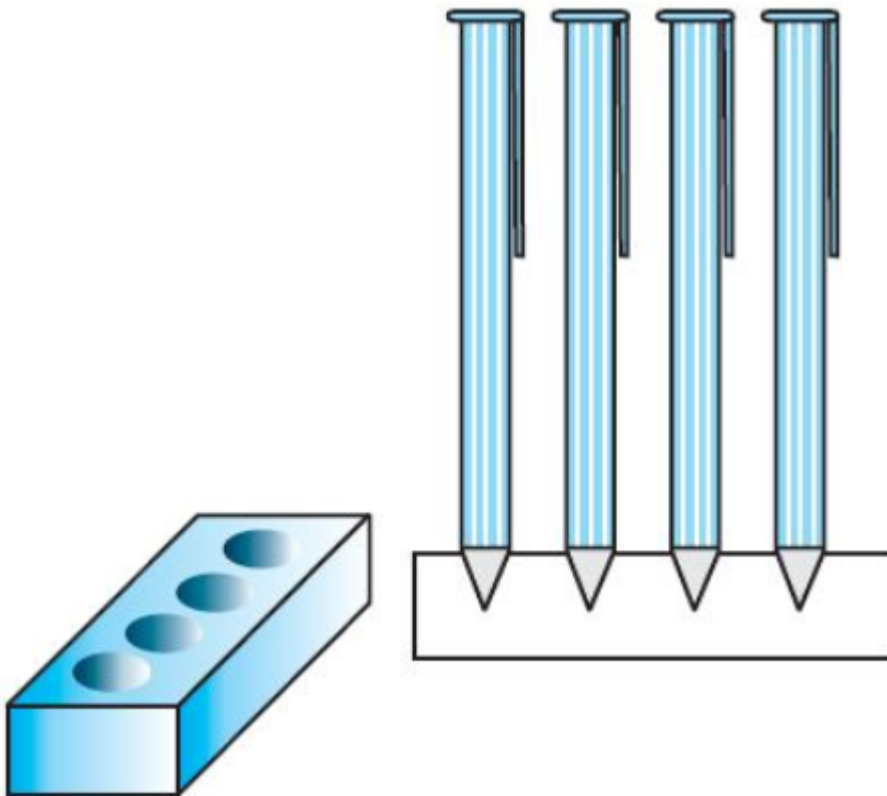
(6) What is the volume of cuboid?

(A) 525 cm³

(B) 225 cm³

(C) 552 cm³

(D) 255 cm³

(7) What is the volume of cone?

(A) 11/3 cm³

(B) 11/30 cm³

(C) 3/11 cm^3

(D) 30/11 cm^3

(8) What is total volume of conical depressions?

     (A) 1.74 cm^3

     (B) 1.44 cm^3

     (C) 1.47 cm^3

     (D) 1.77 cm^3

(9) What is the volume of wood in entire stand?

     (A)522.35 cm^3

     (B) 532.53 cm^3

     (C) 523.35 cm^3

     (D) 523.53 cm^3

(10) Which of the solid's volume is (length × Breadth × Height)

     (A) Cube

     (B) Cuboid

     (C) Cylinder

     (D) Cone

ANSWER:

(6) (A)525 cm^3

Volume of cuboid= 15 x 10 x3.5 = 525 cm^3

(7) (B) 11/30 cm^3

Volume of cone = $\frac{1}{3} \times \pi \times r^2 \times h = \frac{1}{3} \times \frac{22}{7} \times 0.5 \times 0.5 \times 1.4 = \frac{11}{30}\ cm^3$

(8) (C) 1.47 cm^3

Volume of 4 cones = 4 x $\frac{11}{30} = \frac{22}{15} = 1.47\ cm^3$

(9) (D) 523.53 cm^3

Volume of wood = 525 − 1.47 = 523.53 cm^3

(10) (B) Cuboid