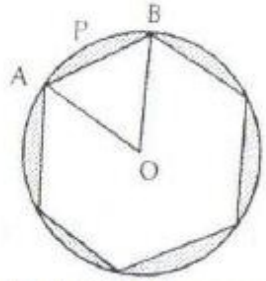
Question 52:



ABCDEF is a hexagon

$\therefore \angle AOB = 60^\circ$, Radius = 35 cm

Area of sector AOB

$= \pi r^2 \times \frac{60^\circ}{360^\circ} = \frac{\pi \times 35 \times 35}{6}\ cm^2$

$= \frac{3.14 \times 35 \times 35}{6}\ cm^2$

$= 641.083\ cm^2$

Area of $\Delta AOB = \frac{\sqrt{3}}{4} \times r^2 = \frac{\sqrt{3}}{4} \times 35 \times 35\ cm^2$

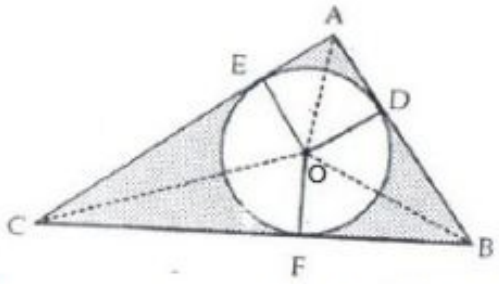
$= 530.425\ cm^2$

Area of segment APB = $(641.083 - 530.425)\ cm^2 = 110.658\ cm^2$

Area of design (shaded area) = $6 \times 110.658\ cm^2 = 663.948\ cm^2$

$= 663.95\ cm^2$

Question 53:



In Δ ABC, $\angle$ A = 90°, AB = 6cm, BC = 10 cm

$$BC^2 = AC^2 + AB^2$$

$$\therefore \quad AC^2 = BC^2 - AB^2 = 10^2 - 6^2 = 100 - 36 = 64$$

$$\therefore \quad AC = 8 \text{ cm}$$

$$\text{Area of } ABC = \frac{1}{2} \times AC \times AB = \frac{1}{2} \times 8 \times 6 \text{cm}^3 = 24 \text{ cm}^2$$

Let r be the radius of circle of centre O

$$\text{Area of } \Delta OCB = \frac{1}{2} \times 10 \times r \text{ cm}^2 = 5r \text{ cm}^2$$

$$\text{Area of } \Delta OAB = \frac{1}{2} \times 6 \times r \text{ cm}^2 = 3r \text{ cm}^2$$

$$\text{Area of } \Delta OCA = \frac{1}{2} \times 8 \times r \text{ cm}^2 = 4r \text{ cm}^2$$

$$\text{Area of } (\Delta OCB + \Delta OAB + \Delta OCA) = \text{Area of } \Delta ABC$$

$$\therefore \quad 5r + 3r + 4r = 24$$

$$\text{or} \quad 12r = 24 \quad \therefore r = 2 \text{ cm}$$

$$\therefore \text{Area of incirde} = \pi r^2 = 3.14 \times 2 \times 2 \text{ cm}^2$$

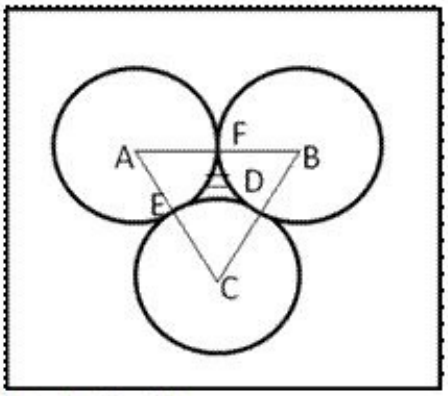
$$= 12.56 \text{ cm}^2$$

$$\Rightarrow \text{Shaded area} = \text{Area of } \Delta ABC - \text{Area of incircle}$$

$$= (24 - 12.56) \text{cm}^2 = 11.44 \text{ cm}^2$$

Question 54:

Area of equilateral triangle ABC = $49\sqrt{3}\ cm^2$



Let a be its side

$\therefore \quad \frac{\sqrt{3}}{4}a^2 = 49\sqrt{3}$

or $\quad a^2 = 49 \times 4$

$\therefore \quad a = 7 \times 2$

$\Rightarrow a = 14\ cm$

Area of sector BDF = $\pi r^2 \times \frac{\theta}{360^\circ}$

$= \frac{22}{7} \times 7 \times 7 \times \frac{60}{360}\ cm$

$= \frac{11 \times 7}{3}\ cm^2 = \frac{77}{3}\ cm^2$

Area of sector BDF = Area of sector CDE = Area of sector AEF

Sum of area of all the sectors

$= \frac{77}{3} \times 3\ cm^2 = 77\ cm^2$

$\therefore$ Shaded area = Area of ΔABC - sum of area of all sectors

$= 49\sqrt{3} - 77\ cm^2 = (84.77 - 77.00)\ cm^2$

$= 7.77\ cm^2$

********** END **********