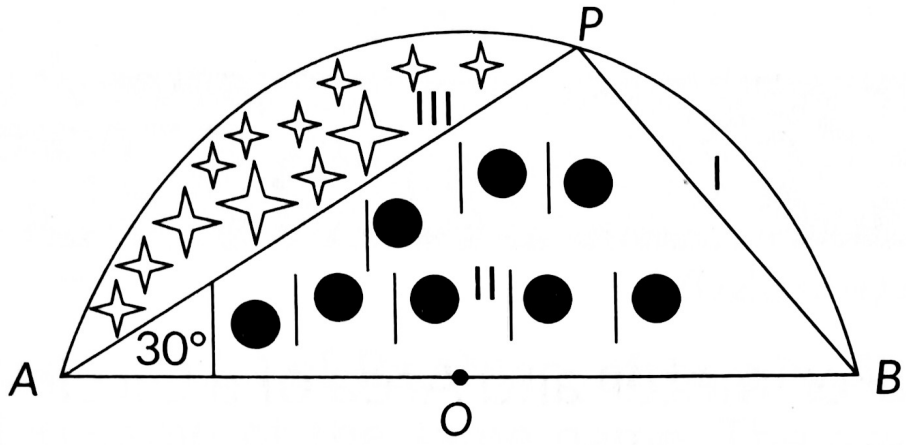
41. **Case Study :** Anurag purchased a farmhouse which is in the form of a semicircle of diameter 70 m. He divides it into three parts by taking a point P on the semicircle in such a way that $\angle PAB = 30°$ as shown in the following figure, where O is the centre of semicircle.



In part I, he planted saplings of Mango tree, in part II, he grew tomatoes and in part III, he grew oranges. Based on given information, answer the following questions.

(i) What is the measure of $\angle POA$?

(ii) Find the length of wire needed to fence entire piece of land.

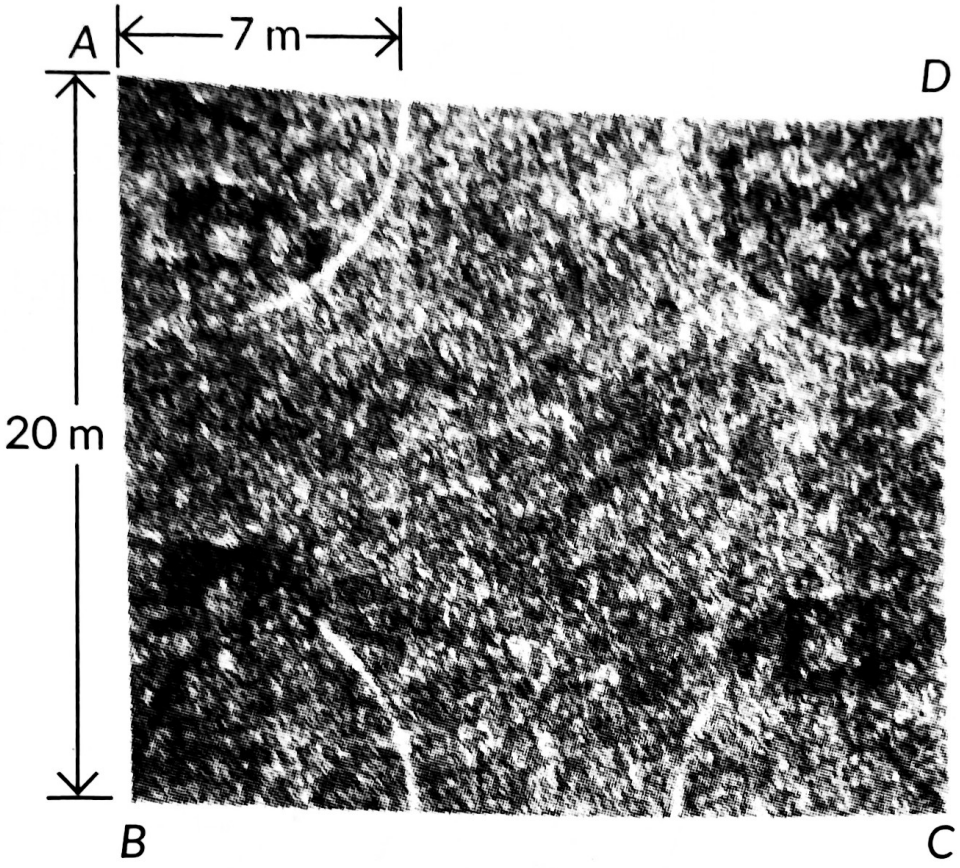
(iii) (a) Find the area of region in which saplings of Mango tree are planted.

OR

(iii) (b) Find the length of wire needed to fence the region III.

(2025) Cr

42. **Case Study :** A stable owner has four horses. He usually tie these horses with 7m long rope to pegs at each corner of a square shaped grass field of 20 m length, to graze in his farm. But tying with rope sometimes results in injuries to his horses, so he decided to build fence around the area so that each horse can graze.



Based on the above, answer the following questions :

(i) Find the area of the square shaped grass field.

(ii) (a) Find the area of the total field in which these horses can graze.

OR

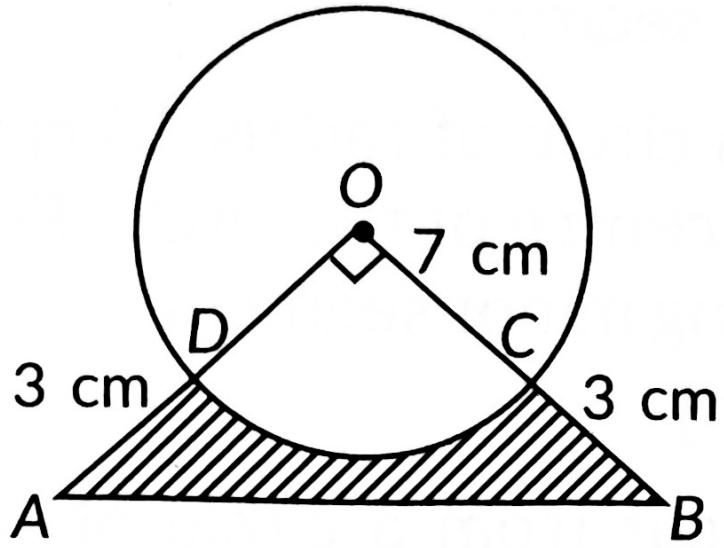
(ii) (b) If the length of the rope of each horse is increased from 7 m to 10 m, find the area grazed by one horse. (Use $\pi = 3.14$)

(iii) What is area of the field that is left ungrazed, if the length of the rope of each horse is 7 cm ?

(2024)

43. **Case Study :** In an annual day function of a school, the organizers wanted to give a cash prize along with a memento to their best students. Each memento is made as shown in the figure and its base *ABCD* is

shown from the front side. The rate of silver plating is ₹ 20 per cm^2.



Based on the above, answer the following questions :

(i) What is the area of the quadrant *ODCO*?

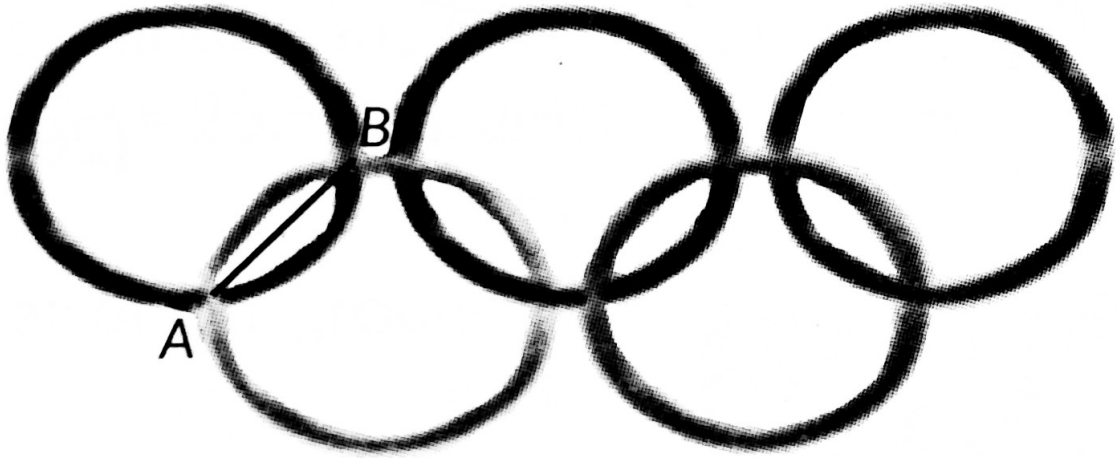
(ii) Find the area of ΔAOB.

(iii) (a) What is the total cost of silver plating the shaded part *ABCD*?

OR

(iii) (b) What is the length of arc *CD*? *(2023) CFQ*

4. Given below is the picture of the Olympic rings made by taking five congruent circles of radius 1 cm each, intersecting in such a way that the chord formed by joining the point of intersection of two circles is also of length 1 cm. Total area of all the dotted regions (assuming the thickness of the rings to be negligible) is



(a) $4\left[\frac{\pi}{12}-\frac{\sqrt{3}}{4}\right]cm^2$

(b) $\left[\frac{\pi}{6}-\frac{\sqrt{3}}{4}\right]cm^2$

(b) $4\left[\frac{\pi}{6}-\frac{\sqrt{3}}{4}\right]cm^2$

(d) $8\left[\frac{\pi}{6}-\frac{\sqrt{3}}{4}\right]cm^2$

(2025-26) An