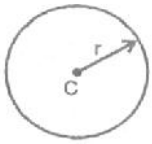
# 12.2 AREA RELTED TO CIRCLE

**Circle:** Circle is a point, which moves so such a manner that its distance from a fixed point id always equal. The fixed point is called center of the circle of the circle and the fixed distance is called radius of the circle.

**Area of circle (A) =** $\pi r^2$

**Circumference (C) =** $2\pi r$

**Diameter (D) = 2r**




**Circle**

**RESULTS:**

(i) If two circles touch internally. then the distance between their centers is equal to the difference of their radii,

(ii) If two circles touch externally, then the distance between their centers is equal to the sum of their radii.

(iii) Distance moved by a rotating wheel in one revolution is the circumference of the wheel.

(iv) Number of revolutions completed by a rotating wheel in one minute = $\frac{\text{Distance moved in one minute}}{\text{Circumference}}$

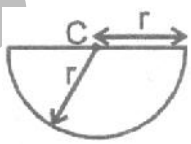
(v) Angle described by minute hand is one minute = $6^0$.

(vi) Angle described by hour hand in one hour =$30^0$.

### (a) Semicircle:

**Perimeter** = $\pi r + 2r = (\pi + 2)r$

**Area (A)** $= \frac{\pi r^2}{2}$




**Semi-Circle**

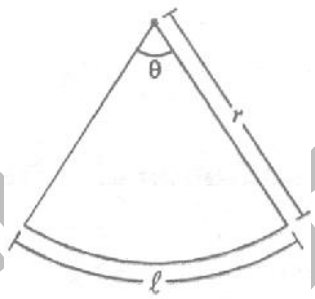
### (b)Sector:

**Area (A)** = $\frac{\pi r^2 \theta}{360^0}$

**Length of arc** $(\ell) = \frac{\pi r \theta}{180^0}$

**Area(A)** = $\frac{1}{2} \times \ell \times r$

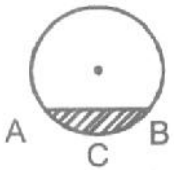
**Perimeter** = $\ell + 2r$



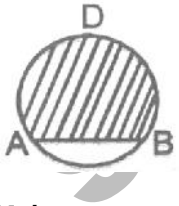

**Sector of a Circle**

### (c)Segment :

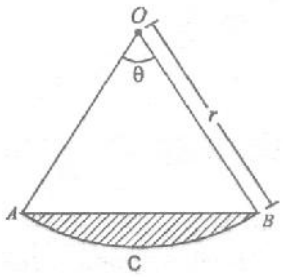
Shaded portion in the figure id called segment of a circle.




**Minor segment**




**Major segment**




**Minor Segment**

**Area of minor segment =Area of the sector -Area of triangle OAB**

$$A = \frac{\pi r^2 \theta}{360^0} - r^2 \sin\frac{\theta}{2}\cos\frac{\theta}{2}$$ **OR** $$A = \frac{\pi r^2 \theta}{360^0} - \frac{r^2}{2}\sin\theta$$

**Here, segment ACB is called manor segment while ADB is called major segment.**