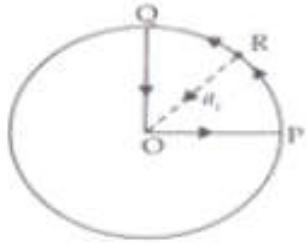


Q 01 A cyclist starts from centre O of a circular park of radius 1 Km and moves along the path OPRQO as shown in the figure. If he maintains the constant speed of 10ms^{-1} , what is his acceleration at point R in magnitude and direction?



Sol. The path of the cyclist at R is circular of constant radius 1 km with centre O and he is moving with constant speed 10m/s. So his motion is uniform circular motion at R.

Hence, the $R = 1000\text{ m}$, $v = 10\text{m/s}$

As we know whenever an object performing circular motion, acceleration is called centripetal acceleration and is always directed towards the centre.

$$\therefore a_c = \frac{v^2}{R} = \frac{10 \times 10}{1000} = \frac{1}{10} = 0.1\text{m/s}^2 \text{ along RO.}$$