

DPP CIRCULAR MOTION

The length of second's hand in a watch is 1 cm. The change in velocity of its tip in 15 second is -

- (a) 0 (b) $\frac{\pi}{30\sqrt{2}}$ cm/s
(c) $\frac{\pi}{30}$ cm/s (d) $\frac{\pi\sqrt{2}}{30}$ cm/s

An electron is moving in a circular orbit of radius 5.3×10^{-11} metre around the atomic nucleus at a rate of 6.6×10^{15} revolutions per second. The centripetal force acting on the electron will be -

- (The mass of the electron is 9.1×10^{-31} kg)
(a) 8.3×10^{-8} N (b) 3.8×10^{-8} N
(c) 4.15×10^{-8} N (d) 2.07×10^{-8} N

An air craft executes a horizontal loop of radius 1 km with a steady speed of 900 km/h. The ratio of centripetal acceleration to that gravitational acceleration will be -

- (a) 1 : 6.38 (b) 6.38 : 1
(c) 2.25 : 9.8 (d) 2.5 : 9.8

A car driver is negotiating a curve of radius 100 m with a speed of 18 km/hr. The angle through which he has to lean from the vertical will be -

- (a) $\tan^{-1} \frac{1}{4}$ (b) $\tan^{-1} \frac{1}{40}$
(c) $\tan^{-1} \left(\frac{1}{2} \right)$ (d) $\tan^{-1} \left(\frac{1}{20} \right)$

A particle moves in a circle of radius 20cm with a linear speed of 10m/s. The angular velocity will be -

- (a) 50 rad/s (b) 100 rad/s
(c) 25 rad/s (d) 75 rad/s

The angular velocity of a particle is given by $\omega = 1.5t - 3t^2 + 2$, the time when its angular acceleration decreases to be zero will be -

- (a) 25 sec (b) 0.25 sec
(c) 12 sec (d) 1.2 sec