Q 2 A mass of 5 kg is moving along a circular path of radius 1 m. If the mass moves with 300 revolutions per minute, its kinetic energy would be

1) 0
2) $250\pi^2$J
3) $5\pi^2$
4) $100\pi^2$

Sol. 2) $250\pi^2$J

Here, we have given that

mass = 5 kg, radius = 1 m

$\omega = \frac{300}{60}$ rps = 5 rps = $5\times 2\pi rads^{-1}$

K.E. = $\frac{1}{2}mv^2 = \frac{1}{2}m(r\omega)^2 = \frac{1}{2}\times 5(1\times 10\pi)^2$ = $250\pi^2$J