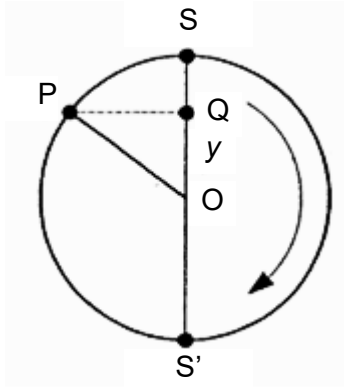


- 15** The given diagram shows a particle rotating clockwise in a horizontal circle of radius r with a constant angular velocity ω . At time t , the particle is at P. At $t = 0$, the particle is at S. The projection of P on the diameter through SS' is represented by Q. With respect to the origin O, the displacement, linear velocity and linear acceleration of Q in the direction OS are y , v and a respectively.



Which set of expressions is correct?

- A** $y = r \cos \omega t$; $v = -r\omega \sin \omega t$; $a = r\omega^2 \cos \omega t$
- B** $y = r \cos \omega t$; $v = -r\omega \sin \omega t$; $a = -r\omega^2 \cos \omega t$
- C** $y = r \cos \omega t$; $v = -r\omega \cos \omega t$; $a = r\omega^2 \sin \omega t$
- D** $y = r \sin \omega t$; $v = -r\omega \cos \omega t$; $a = r\omega^2 \sin \omega t$