**Q. 01** If the angular momentum of a planet of mass m, moving around the Sun in a circular orbit is L, about the center of the Sun, its areal velocity is: [Main 9 Jan. 2019 I]

(a) $\dfrac{L}{m}$

(b) $\dfrac{4L}{m}$

(c) $\dfrac{L}{2m}$

(d) $\dfrac{2L}{m}$

(c) Areal velocity; $\dfrac{dA}{dt}$

$$dA = \frac{1}{2}r^2 d\theta \Rightarrow \frac{dA}{dt} = \frac{1}{2}r^2 \frac{d\theta}{dt} = \frac{1}{2}r^2\omega$$

Also, $L = mvr = mr^2\omega$

$$\therefore \frac{dA}{dt} = \frac{1}{2}\frac{L}{m}$$