2. A particle of charge q and mass m is moving with a velocity $-v\,\hat{i}(v \neq 0)$ towards a large screen placed in the Y-Z plane at a distance d. If there is a magnetic field $\vec{B} = B_0\hat{k}$, the minimum value of v for which the particle will not hit the screen is: **[Sep. 06, 2020 (I)]**

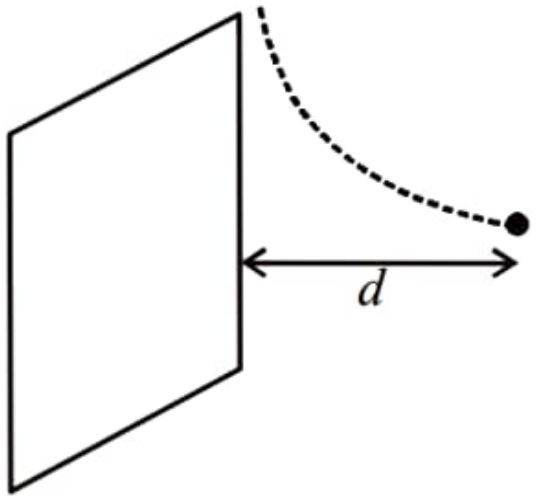
(a) $\frac{qdB_0}{3m}$

(b) $\frac{2qdB_0}{m}$

(c) $\frac{qdB_0}{m}$

(d) $\frac{qdB_0}{2m}$

2. **(c)** In uniform magnetic field particle moves in a circular path, if the radius of the circular path is 'r', particle will not hit the screen.



$$r = \frac{mv}{qB_0} \qquad \left[\because \frac{mv^2}{r} = qvB_0\right]$$

Hence, minimum value of v for which the particle will not hit the screen.

$$v = \frac{qB_0 d}{m}$$