3. In a Young's double slit experiment two slits are separated by 2 mm and the screen is placed one meter away. When a light of wavelength 500 nm is used, the fringe separation will be : [Feb. 26, 2021 (I)]

(a) 0.25 mm (b) 0.75 mm (c) 0.50 mm (d) 1 mm

(a) Fringe width, $\beta = \dfrac{\lambda D}{d}$

Where D is the distance between slit and screen, d is the distance between two slits, λ is the wavelength of light.

$$\therefore \quad \beta = \frac{500 \times 10^{-9} \times 1}{2 \times 10^{-3}}$$

$$= 250 \times 10^{-6} = 0.25 \text{ mm}$$