

5. The elastic limit of brass is 379 MPa. What should be the minimum diameter of a brass rod if it is to support a 400 N load without exceeding its elastic limit?

[10 April 2019 II]

(a) 1.00 mm

(b) 1.16 mm

(c) 0.90 mm

(d) 1.36 mm

5. (b) Stress = $\frac{F}{A} = \frac{400 \times 4}{\pi d^2} = 379 \times 10^6 \text{ N/m}^2$

$$\Rightarrow d^2 = \frac{400 \times 4}{379 \times 10^6 \pi}$$

$$d = 1.15 \text{ mm}$$