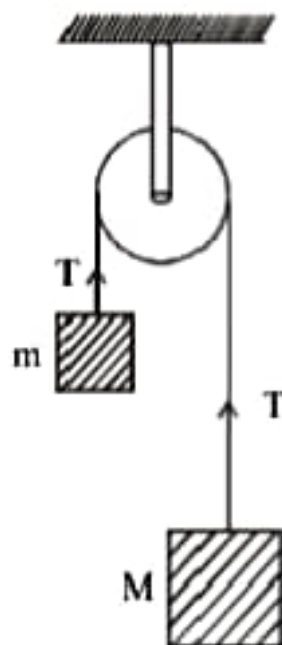


13. Two blocks of masses m and M are connected by means of a metal wire of cross-sectional area A passing over a frictionless fixed pulley as shown in the figure. The system is then released. If $M = 2m$, then the stress produced in the wire is : **[Online April 25, 2013]**



- (a) $\frac{2mg}{3A}$ (b) $\frac{4mg}{3A}$ (c) $\frac{mg}{A}$ (d) $\frac{3mg}{4A}$

13. (b) Tension in the wire, $T = \left(\frac{2mM}{m+M} \right) g$

$$\text{Stress} = \frac{\text{Force / Tension}}{\text{Area}} = \frac{2mM}{A(m+M)} g$$

$$= \frac{2(m \times 2m)g}{A(m+2m)} \quad (M = 2m \text{ given})$$

$$= \frac{4m^2}{3mA} g = \frac{4mg}{3A}$$