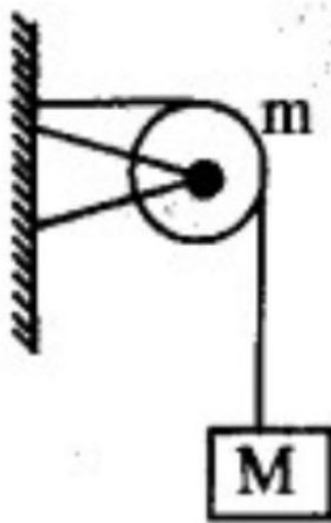


11. A string of negligible mass going over a clamped pulley of mass m supports a block of mass M as shown in the figure. The force on the pulley by the clamp is given by [2001-2 marks]



a) $\sqrt{2} Mg$

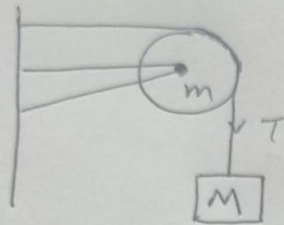
b) $\sqrt{2} mg$

c) $\sqrt{(M+m)^2 + m^2} g$

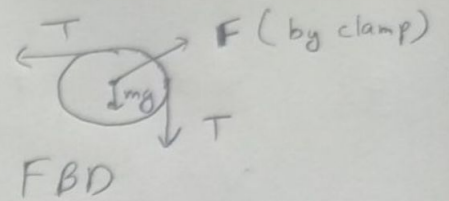
d) $\sqrt{(M+m)^2 + M^2} g$

Solution

①



\Rightarrow



$$\boxed{T = Mg} \quad \text{--- (1)}$$

$$F = (T + mg) \hat{j} + T \hat{i}$$

$$F = \sqrt{T^2 + (T + mg)^2}$$
$$= \sqrt{M^2 g^2 + (M^2 g^2 + mg)^2}$$

$$\boxed{F = g \sqrt{M^2 + (m + M)^2}}$$

(D)