16. Two bodies of masses m_1 and m_2 are connected by a light string which passes over a frictionless massless pulley. If the pulley is moving upward with uniform acceleration $\frac{g}{2}$, then tension in the string will be

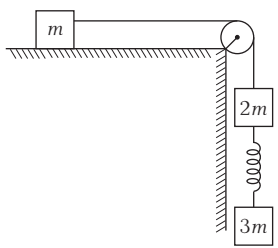
(a) $\frac{3m_1m_2}{m_1 + m_2}\, g$

(b) $\frac{m_1 + m_2}{4m_1 m_2}\, g$

(c) $\frac{2m_1m_2}{m_1 + m_2}\, g$

(d) $\frac{m_1m_2}{m_1 + m_2}\, g$

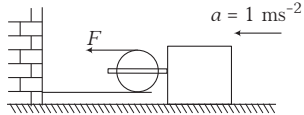
17. In the system shown in figure, assume that all the surfaces are smooth, string and spring are massless. When masses connected are released, the acceleration of the system is



(a) $\frac{17}{5}\,\text{ms}^{-2}$ (b) $\frac{50}{6}\,\text{ms}^{-2}$

(c) $\frac{60}{5}\,\text{ms}^{-2}$ (d) $\frac{60}{7}\,\text{ms}^{-2}$

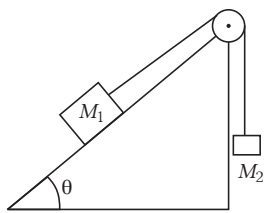
18. A block of mass 200 kg is set into motion on a frictionless horizontal surface with the help of frictionless pulley and a rope system as shown in figure. What horizontal force F should be applied to produce in the block an acceleration of 1 ms^{-2}?



(a) 50 N (b) 100 N

(c) 200 N (d) 10 N

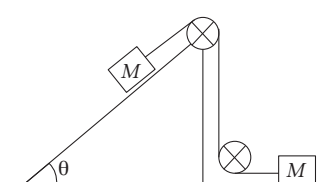
19. Two masses M_1 and M_2 are attached to the ends of a string which passes over a pulley attached to the top of an inclined plane. The angle of inclination of the plane is 30ϒ and M_1 = 10 kg, M_2 = 5 kg. What is the acceleration of mass M_2?



(a) 10 ms^{-2} (b) 5 ms^{-2}

(c) Zero (d) None of these

20. Two blocks, each having a mass M, rest on frictionless surfaces as shown in the figure. If the pulleys are light and frictionless and M on the incline is allowed to move down, then the tension in the string will be



(a) $\frac{2}{3}\, Mg\sin\theta$ (b) $\frac{3}{2}\, Mg\sin\theta$

(c) $\frac{Mg\,\sin\theta}{2}$ (d) $2Mg\,\sin\theta$