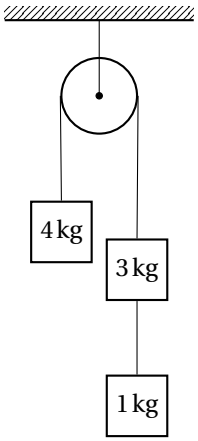
Module-Test-6
(Physics-NEET)

December 17, 2022

33. In the arrangement shown in figure, the ratio of tensions in the strings attached with 4 kg block and that with 1 kg block is



a) 2 : 1
b) 4 : 1 *Ans.*
c) 1 : 2
d) 1 : 4

34. Problems of non-intertial frames can be solved only with the concept of pseudo force.

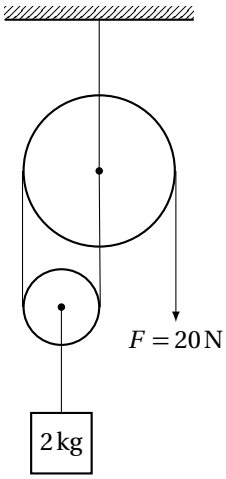
a) Above statement is wrong *Ans.*
b) Above statement is right
c) Can't say anything
d) Above statement is right for some cases and wrong for some cases

35. A particle is dropped from a height h. Another particle which is initially at a horizontal distance d from the first is simultaneously projected with a horizontal velocity u and the two particles just collide on the ground. Then

a) $d^2 = \frac{u^2 h}{2h}$
b) $d^2 = \frac{2u^2 h}{g}$ *Ans.*
c) $d = h$
d) $g d^2 = u^2 h$

Section-B

1. The acceleration of the 2 kg block, if the free end of string is pulled with a force of 20 N as shown, is



a) zero
b) $10\,\mathrm{m\,s^{-2}}$ upward *Ans.*
c) $5\,\mathrm{m\,s^{-2}}$ upward
d) $5\,\mathrm{m\,s^{-2}}$ downward

2. 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 $g/2$ then tension in the string will be

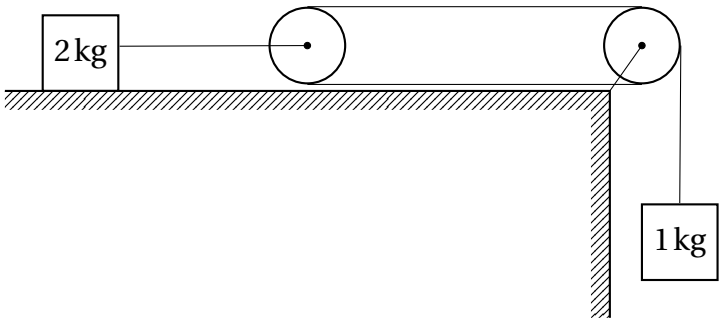
a) $\frac{3m_1m_2}{m_1+m_2}g$ *Ans.*

b) $\frac{m_1+m_2}{4m_1m_2}g$

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

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

3. Consider the situation shown in figure. Both the pulleys 2 kg and the string are light and all the surfaces are smooth. The acceleration of 1 kg block is



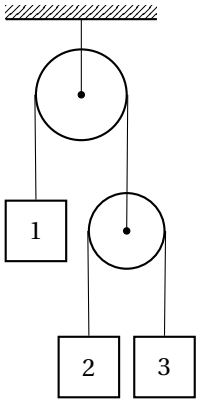
a) $\frac{g}{3}\,\mathrm{m\,s^{-2}}$

b) $\frac{2g}{3}\,\mathrm{m\,s^{-2}}$ *Ans.*

c) $\frac{4g}{3}\,\mathrm{m\,s^{-2}}$

d) $\frac{6g}{3}\,\mathrm{m\,s^{-2}}$

4. Find the relation between a_1, a_2 and a_3 where a_1, a_2 and a_3 are accelerations of the blocks 1, 2 and 3.



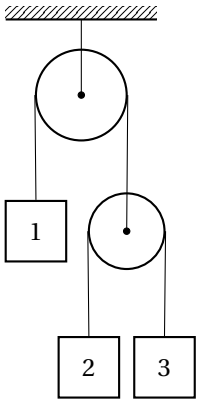
a) $2a_1+a_2+a_3=0$ *Ans.*

b) $a_1+2a_2+a_3=0$

c) $a_1+a_2+2a_3=0$

d) $a_1+a_2+a_3=0$

5. In the figure shown, $a_3=6\,\mathrm{m\,s^{-2}}$ (downwards) and $a_2=4\,\mathrm{m\,s^{-2}}$ (upwards). The acceleration of 1 is



a) $1\,\mathrm{m\,s^{-2}}$ downward

b) $2\,\mathrm{m\,s^{-2}}$ upward

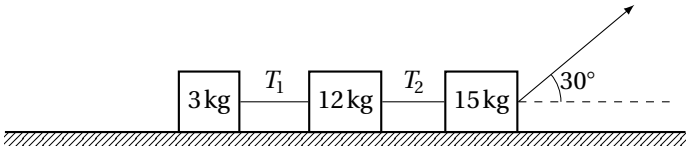
c) $1\,\mathrm{m\,s^{-2}}$ upward *Ans.*

d) $2\,\mathrm{m\,s^{-2}}$ downward

6. Three blocks of masses 3 kg, 2 kg and 1 kg are placed side by side on a smooth surface as shown in figure. A horizontal force of 12 N is applied on 3 kg block. The net force on 2 kg block is

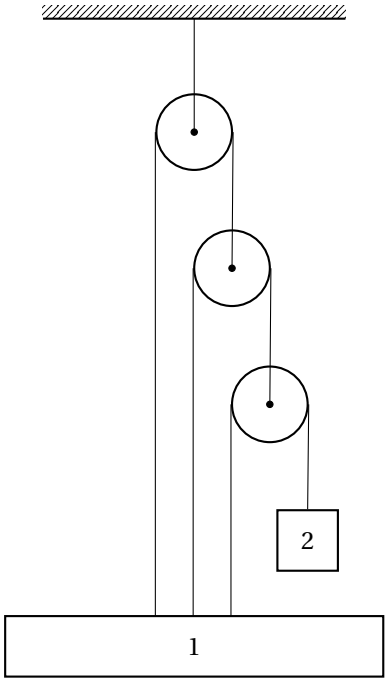
a) 2 N
b) 3 N
c) 4 N *Ans.*
d) 5 N

7. The surface is frictionless, the ratio between T_1 and T_2 is



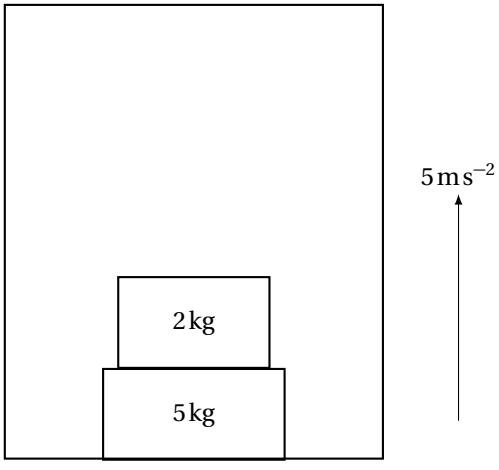
a) $\sqrt{3}:1$
b) $1:\sqrt{3}$
c) $1:5$ *Ans.*
d) $5:1$

8. Find the relation between a_1 and a_2 .



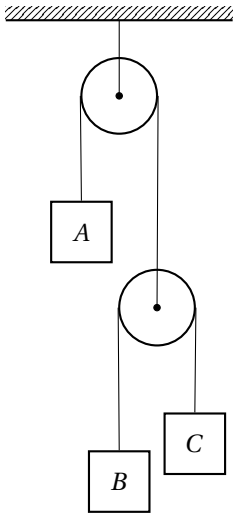
a) $a_1+7a_2=0$
b) $7a_1+a_2=0$ *Ans.*
c) $3a_1+a_2=0$
d) $a_1+3a_2=0$

9. Find the force exerted by 5 kg block on floor of lift, as shown in figure. (Take, $g=10\,\mathrm{m\,s^{-2}}$)



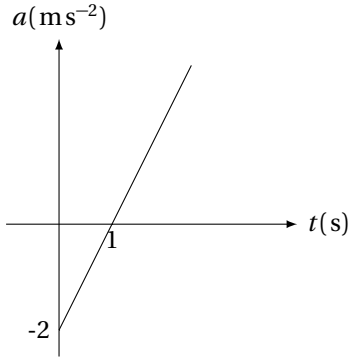
a) 100 N
b) 115 N
c) 105 N *Ans.*
d) 135 N

10. In the pulley-block arrangement shown in figure, find relation between a_A , a_B and a_C .



a) $2a_A + a_B + a_C = 0$ *Ans.*
b) $a_A + a_B + a_C = 0$
c) $a_A + 2a_B + a_C = 0$
d) $a_A + a_B + 2a_C = 0$

11. The acceleration of particle varies with time as shown. Then the expression of v as a function of time t is



a) $v = t^2 - 2t$ *Ans.*
b) $v = t^2 + 2t$
c) $v = -t^2 + 2t$
d) $v = -t^2 - 2t$

12. A projectile is projected with speed u at an angle of 60° with horizontal from the foot of an inclined plane. If the projectile hits the inclined plane horizontally, the range on inclined plane will be

a) $\frac{u^2\sqrt{21}}{2g}$
b) $\frac{3u^2}{4g}$
c) $\frac{u^2}{2g}$
d) $\frac{u^2\sqrt{21}}{8g}$ *Ans.*

13. A particle starts from the origin of coordinates at time $t = 0$ and moves in the xy plane with a constant acceleration α in the y-direction. Its equation of motion is $y = \beta x^2$. Its velocity component in the x-direction is

a) variable
b) $\sqrt{\frac{2\alpha}{\beta}}$
c) $\frac{\alpha}{2\beta}$
d) $\sqrt{\frac{\alpha}{2\beta}}$ *Ans.*

14. At a height of 15 m from ground velocity of a projectile is $\vec{v} = (10\hat{i} + 10\hat{j})$. Here, $\hat{j}$ is vertically upwards and $\hat{i}$ is along horizontal direction then $(g = 10\,\mathrm{m\,s^{-2}})$

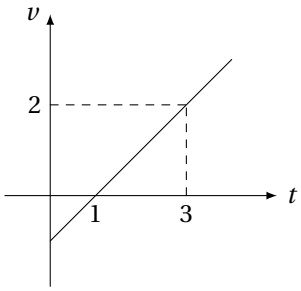
a) particle was projected at an angle of 45° with horizontal

b) time of flight of projectile is 4 s *Ans.*

c) horizontal range of projectile is 100 m

d) maximum height of projectile from ground is 20 m *Ans.*

15. The velocity of a particle depends on time t as $v = t - 1$, finds the displacement covered by the particle during $t = 1$ to $t = 3$ seconds.



a) 0

b) $2m$ *Ans.*

c) $-2m$

d) None of these