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TARGET : NEET (UG) 2024

Course : SARANSH (Youtube Live CRASH COURSE)

PHYSICS

DPP

DAILY PRACTICE PROBLEMS

DPP NO. 1

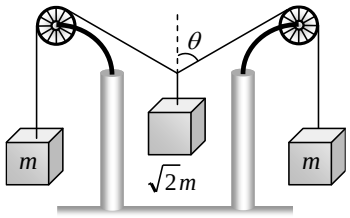
PHYSICS: NEWTON'S LAW OF MOTION

DPP No. : 1

1. A ship of mass 3×10^7 kg initially at rest is pulled by a force of 5×10^4 N through a distance of 3 *m*. Assume that the resistance due to water is negligible, the speed of the ship is

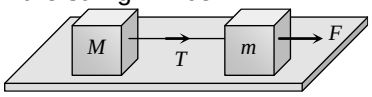
(1) 1.5 m/s (2) 60 m/s (3) 0.1 m/s (4) 5 m/s

2. The pulleys and strings shown in the figure are smooth and of negligible mass. For the system to remain in equilibrium, the angle θ should be :



(1) 0º (2) 30º (3) 45º (4) 60º

3. Two masses *M* and *m* are connected by a weightless string. They are pulled by a force *F* on a frictionless horizontal surface. The tension in the string will be

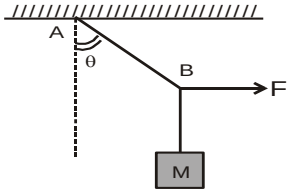


(1) $\frac{FM}{m+M}$ (2) $\frac{F}{m+M}$ (3) $\frac{Fm}{M}$ (4) $\frac{Fm}{M+m}$

4. Two weights w_1 and w_2 are suspended from the ends of a light string passing over a smooth fixed pulley. If the pulley is pulled up at an acceleration *g*, the tension in the string will be

(1) $\frac{4w_1w_2}{w_1+w_2}$ (2) $\frac{2w_1w_2}{w_1+w_2}$ (3) $\frac{w_1w_2}{w_1+w_2}$ (4) $\frac{w_1w_2}{2(w_1+w_2)}$

5. A mass M is suspended by a rope from a rigid support at A as shown in figure. Another rope is tied at the end B, and it is pulled horizontally with a force F. If the rope AB makes an angle θ with the vertical in equilibrium, then the tension in the string AB is :

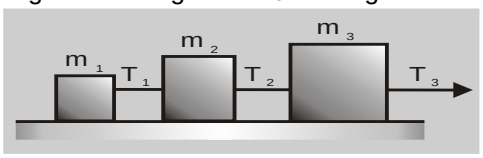


(1) F sin θ (2) F/sin θ (3) F cos θ (4) F/cos θ

6. A uniform thick rope of length 5m is kept on frictionless surface and a force of 5N is applied to one of its end. Find tension in the rope at 1m from this end-

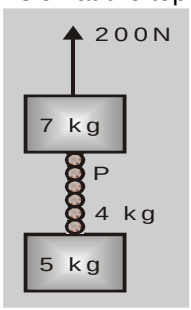
(1) 1N (2) 3N (3) 4N (4) 5N

7. Three block are connected as shown in fig., on a horizontal frictionless table and pulled to the right with a force $T_3 = 60$ N. If $m_1 = 10$ kg. $m_2 = 20$ kg. and $m_3 = 30$ kg. the tension T_2 is-



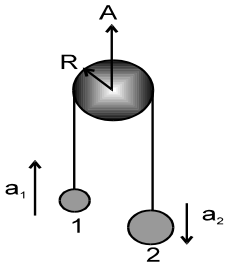
(1) 10 N (2) 20 N (3) 30 N (4) 60 N

8. Two blocks of 7 kg and 5 kg are connected by a heavy rope of mass 4 kg. An upward force of 200N is applied as shown in the diagram. The tension at the top of heavy rope at point P is- ($g = 10$ m/s^2)



(1) 2.27 N (2) 112.5 N (3) 87.5 N (4) 360 N

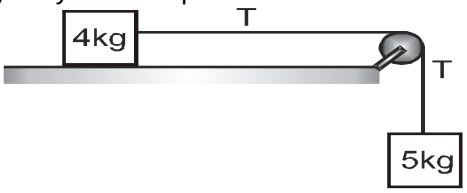
9. Two masses are connected by a string which passes over a pulley accelerating upward at a rate A as shown. If a_1 and a_2 be the acceleration of bodies 1 and 2 respectively then :



(1) $A = a_1 - a_2$ (2) $A = a_1 + a_2$ (3) $A = \frac{a_1 - a_2}{2}$ (4) $A = \frac{a_1 + a_2}{2}$.

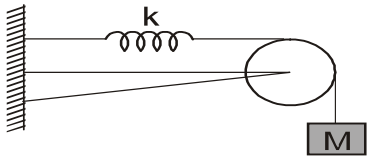
10. A rider on horse falls back when horse starts running, all of a sudden because-
(1) rider is taken back
(2) rider is suddenly afraid of falling
(3) inertia of rest keeps the upper part of body at rest while lower part of the body moves forward with the horse
(4) none of the above

11. Two bodies of 5 kg and 4 kg are tied to a string as shown in the fig. If the table and pulley both are smooth, acceleration of 5 kg body will be equal to-



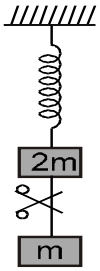
(1) g (2) $\frac{g}{4}$ (3) $\frac{4g}{9}$ (4) $\frac{5g}{9}$

12. A spring 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 at the time of equilibrium is given by -



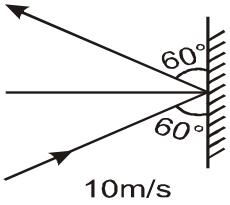
(1) $\sqrt{2}$ Mg (2) $\sqrt{(mg)^2+(kx)^2}$ (3) $\left(\sqrt{(M+m)^2+m^2}\right)g$ (4) $\left(\sqrt{(M+m)^2+M^2}\right)g$

13. System shown in figure is in equilibrium and at rest. The spring and string are massless Now the string is cut. The acceleration of mass 2m and m just after the string is cut will be :



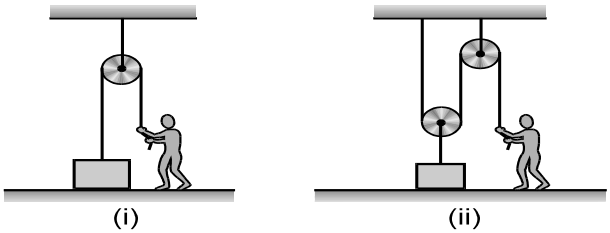
(1) g/2 upwards , g downwards (2) g upwards, g/ 2 downwards
(3) g upwards , 2g downwards (4) 2g upwards , g downwards

14. A body of mass 3 kg hits a wall at an angle of 60° and with speed of 10 m/s and returns at the same angle. The impact time is 0.2 sec. Calculate force exerted on the wall :



(1) $150\sqrt{3}$N (2) 100 N (3) $50\sqrt{3}$N (4) $75\sqrt{3}$N

15. In the figure shown, a person wants to raise a block lying on the ground to a height h. In both the cases if time required is same then in which case he has to exert more force. Assume pulleys and strings light.



(1) (i)
(2) (ii)
(3) same in both
(4) Cannot be determined