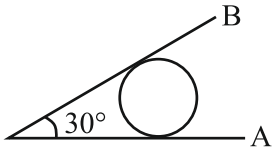
Yakeen NEET 2.0 2026

Laws of Motion

Assignment-01
By: M.R. Sir

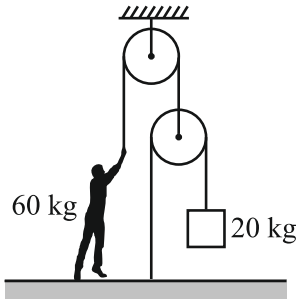
1. An sphere weighs 10 N and rest in V shaped though whose sides form an angle 30°. Normal reaction excerted by wall B on sphere is:



(1) 10 N (2) $5\sqrt{3}$ N

(3) 5 N (4) Zero

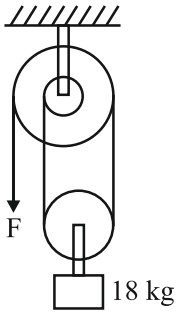
2. A man of mass 60 kg is standing on a massless plank and holding a string passing over a system of ideal pulley such that the system is in equilibrium. The force exerted by the plank on the man is:
(g = acceleration due to gravity)



(1) 20 g (2) 40 g

(3) 45 g (4) 60 g

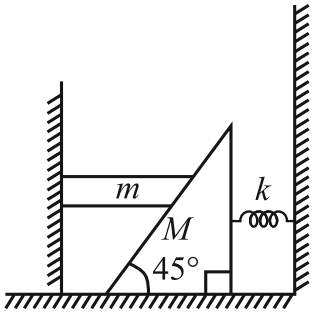
3. In the figure at the free end a force F is applied to keep the suspended mass of 18 kg at rest. The value of F is:



(1) 180 N (2) 90 N

(3) 60 N (4) 30 N

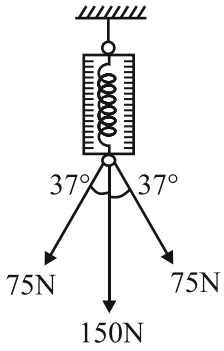
4. All surfaces shown in the figure are smooth. If the whole system is in equilibrium, the compression in spring will be



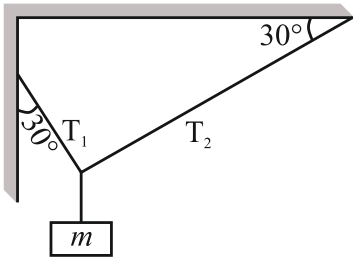
(1) $\frac{mg}{\sqrt{2}k}$ (2) $\frac{mg}{2k}$

(3) $\frac{(M+m)g}{\sqrt{2}k}$ (4) $\frac{mg}{k}$

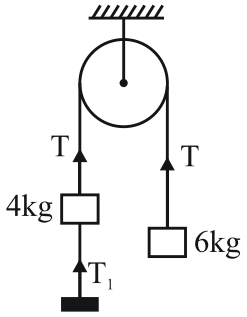
5. The scale in figure is being pulled on by three ropes. What net force (in N) does the spring scale read?



6. Calculate T_1 & T_2.



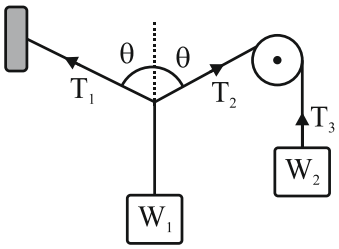
7. Two bodies of mass 4 kg and 6 kg are attached to the ends of a string passing over a pulley. The 4 kg mass is attached to the table top by other string. The tension in this string T_1 is equal to



(1) 10 N (2) 10.6 N

(3) 25 N (4) 20 N

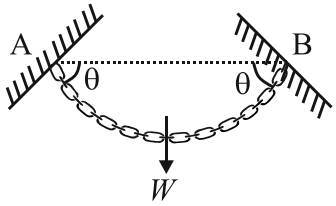
8. In the following figure, the pulley is massless and frictionless. The relation between T_1, T_2 and T_3 will be:



(1) $T_1 = T_2 \neq T_3$ (2) $T_1 \neq T_2 = T_3$

(3) $T_1 \neq T_2 \neq T_3$ (4) $T_1 = T_2 = T_3$

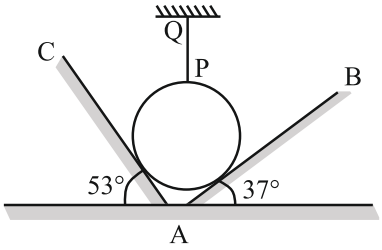
9. A flexible chain of weight W hangs between two fixed points A and B at the same level. The inclination of the chain with the horizontal at the two points of support is θ. What is the tension of the chain at the endpoint?



(1) $\frac{W}{2}\text{cosec}\,\theta$ (2) $\frac{W}{2}\sec\theta$

(3) $W\cos\theta$ (4) $\frac{W}{2}\sin\theta$

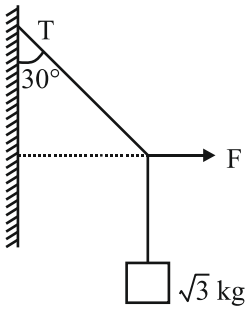
10. A cylinder of mass 10 kg is resting between two frictionless inclined surfaces AB and AC, and it is attached to a vertical string PQ whose other end Q is fixed to the ceiling, as shown in the figure. If the forces applied by cylinder to surfaces AC and AB are 30 N and 40 N, respectively, the tension in the string is (in N) [$g = 10\ m/s^2$]



(1) 20 (2) 50

(3) 30 (4) 40

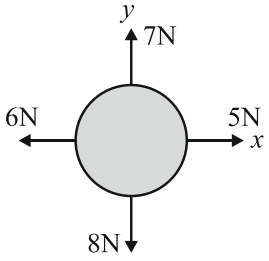
11. A block of $\sqrt{3}$ kg is attached to a string whose other end is attached to the wall. An unknown force F is applied so that the string makes an angle of 30° with the wall. The tension Tin the string is:
(Given $g = 10\ ms^2$) **[JEE Main 2023]**



(1) 20 N (2) 25 N

(3) 10 N (4) 15 N

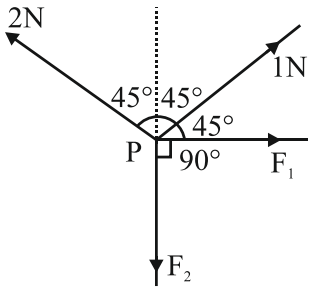
12. For a free body diagram shown in the figure, the four forces are applied in the 'x' and 'y' directions. What additional force must be applied and at what angle with positive x-axis so that the net acceleration of body is zero? **[JEE Main 2022]**



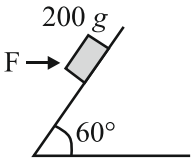
(1) $\sqrt{2}$ N, 45° (2) $\sqrt{2}$ N, 135°

(3) $\frac{2}{\sqrt{3}}$ N,30° (4) 2 N, 45°

13. Four forces are acting at a point P in equilibrium as shown in figure. The ratio of force F_1 to F_2 is $1 : x$ where, $x =$ _____. **[JEE Main 2022]**

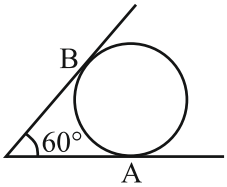


14. A block of mass 200 g is kept stationary on a smooth inclined plane by applying a minimum horizontal force $F = \sqrt{x}$ N as shown in figure. The value of $x =$ _____. **[JEE Main 2022]**

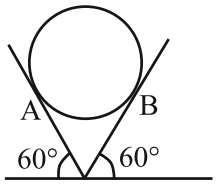


15. An iron sphere weighing 10 N rests in a V shaped smooth trough whose sides form an angle of 60° as shown in the figure. Then the reaction forces are:

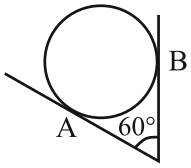
($g = 10$ m/s^2)



(i)



(ii)



(iii)

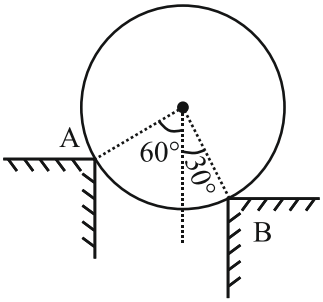
(1) $R_A = 10$ N and $R_B = 0$ in case (i)

(2) $R_A = 10$ N and $R_B = 0$ in case (ii)

(3) $R_A = \frac{20}{\sqrt{3}}$ N and $R_B = \frac{10}{\sqrt{3}}$ in case (iii)

(4) $R_A = 10$ N and $R_B = 10$ N in all the three cases

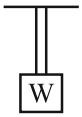
16. A cylinder of mass M and radius R is resting on two corner edges A and B as shown in figure. The normal reaction at the edges A and B are: (Neglect friction):



(1) $N_A = \sqrt{2}N_B$ (2) $N_B = \sqrt{3}N_A$

(3) $N_A = \frac{Mg}{2}$ (4) $N_B = \frac{2\sqrt{3}Mg}{5}$

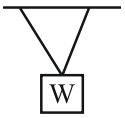
17. A weight can be hung in any of following four ways by using same string. In which case is the string more likely is break



(A)

(B)

(C)

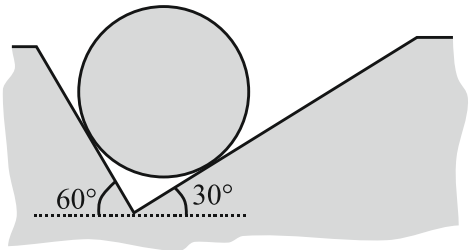


(D)

(1) A (2) B

(3) C (4) D

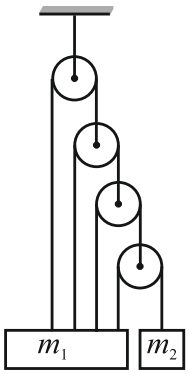
18. A cylinder of mass $1/\sqrt{3}$ kg is placed on the corner of two inclined planes as shown in the figure. Find the normal reaction at contact point of cylinder with the slope of inclination 30°.



(1) 15 N (2) 10 N

(3) 5 N (4) 7 N

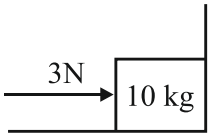
19. If system is in equilibrium then find relation between m_1 and m_2.



(1) $\frac{m_1}{m_2}=\frac{1}{2}$ (2) $\frac{m_1}{m_2}=\frac{1}{15}$

(3) $\frac{m_1}{m_2}=\frac{1}{10}$ (4) $\frac{m_1}{m_2}=1$

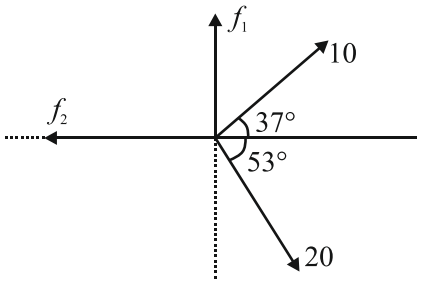
20. A block is kept at the corner of two walls and force 3N is applied on block. If μ = 0.1, between block and walls then frictional force acting on block equal to:



(1) 3 N (2) 10 N

(3) 0 (4) cannot be determined

21. Four forces act on a particle as shown in the figure such that net force is zero. Then consider following statements:



(A) Magnitude of $\vec{f}_1$ is 10 N

(B) Magnitude of $\vec{f}_1$ is 20 N

(C) Magnitude of $\vec{f}_2$ is 10 N

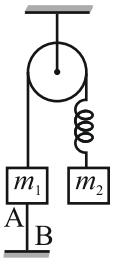
(D) Magnitude of $\vec{f}_2$ is 20 N

Select correct alternative

(1) Only A (2) Only C

(3) Only D (4) Only A and D

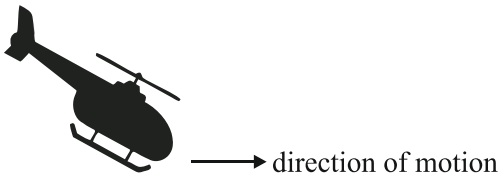
22. In a given figure, two masses m_1 and m_2 ($m_2 > m_1$) are at rest in equilibrium position. Find the tension in string AB

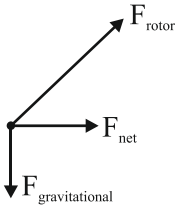


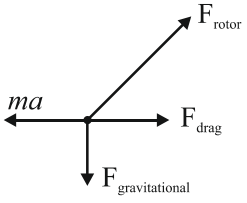
(1) m_1g (2) m_2g

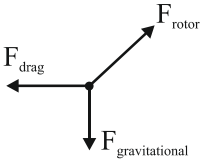
(3) $(m_1 + m_2)g$ (4) $(m_2 - m_1)g$

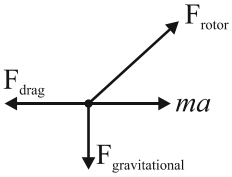
23. A helicopter is moving to the right in horizontal plane. It experiences three forces $\vec{F}_{\text{gravitational}}$, $\vec{F}_{\text{drag}}$ and upthurst force on it caused by rotor $\vec{F}_{\text{rotor}}$ and its net acceleration being 'a'. Which of the following diagrams can be correct free body diagram w.r.t. to a stationary observer on ground?



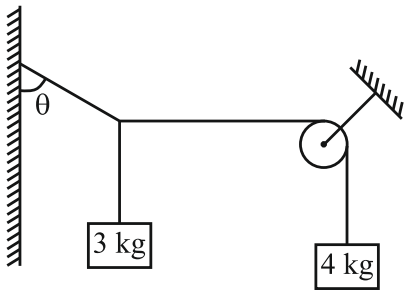
(1)


(2)


(3)


(4)


24. In shown system, each of the block is at rest. The value of θ is



(1) $\tan^{-1}(1)$ (2) $\tan^{-1}\left(\frac{3}{4}\right)$

(3) $\tan^{-1}\left(\frac{4}{3}\right)$ (4) $\tan^{-1}\left(\frac{3}{5}\right)$