

NEW STANDARD ACADEMY

Marks: 60

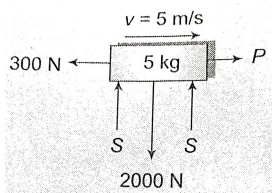
Date : 22-07-24

CLASS : 11TH JEE

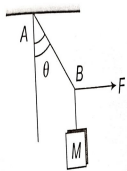
Time: 3 HRS

PHYSICS

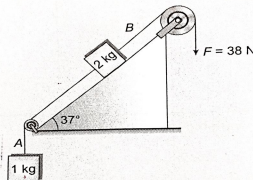
1. The forces acting on an object are shown in the figure. If the body moves horizontally at a constant speed of 5 m/s, then the values of the forces P and S are, respectively



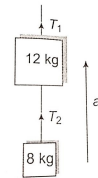
2. A mass M is suspended by a rope from a rigid support at A as shown in the figure. Another rope is tied at the end B, and it is pulled horizontally with a force F. If the rope AB makes an angle θ with the vertical in equilibrium, then the tension in the string AB is



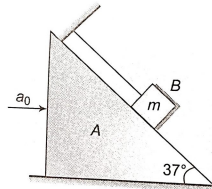
3. For the situation shown in the figure, all pulleys are smooth and fixed. The inclined plane is also smooth. A constant force F of 38 N is applied at the end of the string. Find the ratio of magnitudes of tension in light strings A and B



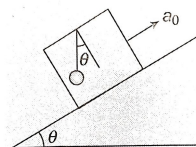
4. A body of mass 8 kg is hanging another body of mass 12 kg. The combination is being pulled by a string with an acceleration of 2.2 ms^{-2} . The tension T_1 , and T_2 , will be respectively (use $g = 9.8 \text{ m/s}^2$)



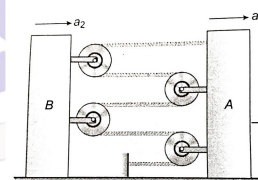
5. A block B of mass 5 kg is attached with smooth triangular block moving horizontally with an acceleration a_0 . The block B is stationary with respect to the triangular block. Find the minimum acceleration of the triangular block so that string slacks.



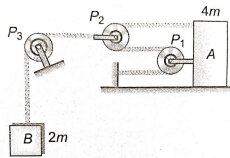
6. A pendulum hangs from the roof of a cart moving with an acceleration $a = 1 \text{ m/s}^2$. The bob is stationary with respect to the cart. Find the value of θ .



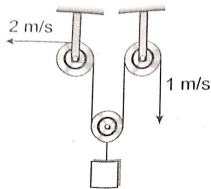
7. Blocks A and B are connected through light string passing through light smooth pulleys as shown in figure. Find the relation between a_1 and a_2



8. Pulleys are light and smooth. Pulleys P₁ and P₂ are fixed. The horizontal surface is smooth. Find the acceleration of blocks A and B



9. Find the velocity of the hanging block if the velocities of the free ends of the rope are as indicated in the figure



10. The mass of a body measured by a physical balance in a lift at rest is found to be m . If the lift is going up with an acceleration a , its mass will be measured as?

CHEMISTRY

- The H-O-H bond angle in the water molecule is 105° , the H-O bond distance being 0.94 \AA . The dipole moment for the molecule is 1.85 D . Calculate the charge on the oxygen atom.
- For an ionic compound $AX_3(s)$ formed between a metal A and a non-metal X (outermost shell configuration of X = $n s^2 n p^5$) Find the enthalpy of formation (magnitude) of $AX_3(s)$ in kcal mol^{-1} with the help of the following data. (Non-metal X is found to exist in nature as a diatomic gas)

$\Delta H_{\text{Sublimation}}$	$A(s) = 100 \text{ kcal/mol}$	$A(g) = 60 \text{ kcal/mol}$
	$A(g) = 150 \text{ kcal/mol}$	$A(g) = 280 \text{ kcal/mol}$
ΔH_{diss}	$X_2(g) = 80 \text{ kcal/mol}$	
	$\Delta H_{\text{e.g.}}$	$X(g) = -110 \text{ kcal/mol}$
$\Delta H_{\text{Lattice energy}}$	$AX_3(s) = -470 \text{ kcal/mol}$	

- Calculate the electronegativity of fluorine from the following data:
 $E_{\text{H-H}} = 104.2 \text{ kcal mol}^{-1}$, $E_{\text{F-F}} = 36.6 \text{ kcal mol}^{-1}$, $E_{\text{H-F}} = 134.6 \text{ kcal mol}^{-1}$,
 Electronegativity of H = 2.1
- a) Ice is lighter than water. Why?

b) KHF_2 is known but KCl_2 is unknown. Why?

- SnCl_2 is solid but SnCl_4 is liquid. Explain.
- Me_3N is pyramidal in shape while $(\text{SiH}_3)_3\text{N}$ is planar. Why?
- Boron does not usually form a cation. Why?
- AlCl_3 is mostly covalent while AlF_3 is mostly ionic. Why?
- Why H_2O is liquid while H_2S is gas?
- Why axial bonds of PCl_5 are longer than equatorial bonds?

MATH'S

- Seventh term of an A.P is 40, then the sum of its first 13 terms is
- The sum of the first four terms of an A.P is 56. The sum of the last four terms is 112. If its first term is 11, then the number of terms is
- If the Sum of the first 10 terms of an A.P is 4 times the sum of its first 5 terms, then the ratio of the first term to the common difference is
- The terms of a G.P. are positive. If each term is equal to the sum of two terms that follow it, then the common ratio is
- The 20th term of the series $2 \times 4 + 4 \times 6 + 6 \times 8 + \dots$ will be
- If $3 + 3\alpha + 3\alpha^2 + \dots \infty = \frac{45}{8}$, then the value of α will be
- If a, b and c are in G.P. such that x and y are the arithmetic means between a, b and b, c respectively then $\frac{a}{x} + \frac{c}{y}$ is equal to
- Consider the sequence $8A + 2B, 6A + B, 4A, 2A - B, \dots$. Which term of this sequence will have a coefficient of A which is twice the coefficient of B?
- If A.M. between p th and q th terms of an A.P., is equal to the A.M. between r th and s th terms of the A.P., then $p + q$ is equal to
- The first three terms of a geometric sequence are x, y and z having their sum equal to 42. If the middle term y is multiplied by $5/4$, the numbers form an arithmetic sequence. The largest possible value of x is