

# NEW STANDARD ACADEMY

Marks: 60

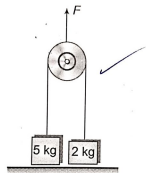
Date : 29-07-24

CLASS : 11<sup>TH</sup> JEE

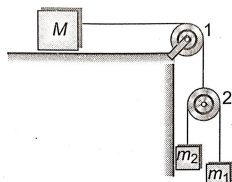
Time: 3 HRS

## PHYSICS

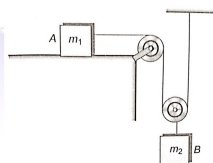
- Two blocks of masses 5 kg and 2 kg are initially at rest on the floor. They are connected by a light string, passing over a light frictionless pulley. An upward force  $F$  is applied on the pulley and maintained at a constant value. Calculate the acceleration  $a_1$  and  $a_2$  of the 5 kg and 2 kg masses, respectively, when  $F$  is (take  $g = 10 \text{ ms}^{-2}$ )



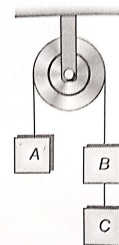
- In the arrangement shown in the figure,  $m_1 = 1 \text{ kg}$ ,  $m_2 = 2 \text{ kg}$ . Pulleys are massless and strings are light. For what value of  $M$  the mass  $m_1$  moves with constant velocity.



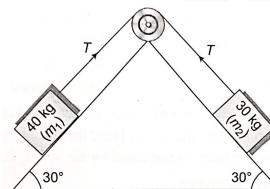
- Two forces, with equal magnitude  $F$ , act on a body and the magnitude of the resultant force is  $F/3$ . Find the angle between the two forces.
- Find the acceleration of block B in the figure.



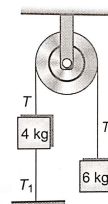
- Three equal weights A, B, C of mass 2 kg each are hanging on a string passing over a fixed frictionless pulley as shown in the figure. The tension in the string connecting weights B and C is



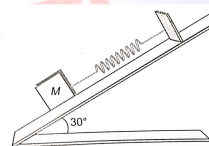
- Two masses 40 kg and 30 kg are connected by a weightless string passing over a frictionless pulley as shown in the following figure. The tension in the string will be



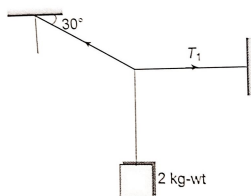
- Two bodies of mass 4 kg and 6 kg are attached to the ends of a string passing over a pulley. The 4 kg mass is attached to the table top by another string. The tension in this string  $T_1$  is equal to (Take  $g = 10 \text{ m/s}^2$ )



- If rope of lift breaks suddenly, the tension exerted by the surface of lift.
- A body of mass 5 kg is suspended by a spring balance on an inclined plane as shown in figure. The spring balance measures



- A body of weight 2 kg is suspended as shown in the figure. The tension  $T_1$  in the horizontal string (in kg wt) is



### CHEMISTRY

- Describe reversible and irreversible processes & write the difference between them.
- Write the definition & significant features of "U"
- Write First law of thermodynamics with its mathematical Expression.
- Describe work done in irreversible isothermal expanded.
- Two liters of  $N_2$  at  $0^\circ C$  and 5atm process is expanded isothermally against a constant external pressure of 1 atm until the pressure of gas reaches 1 litre. Assuming gas to be ideal calculate the work of expansion.
- What do you understand by thermodynamic process. Write its types
- What is heat? What will the change in heat at constant pressure and constant volume?
- A gas occupies 2L at STP. It is provided 300 joule heat so that its volume becomes 2.5 L at 1 atm calculate the change in its internal energy.
- What is system? Explain its types
- During a chemical reaction increase in the volume of a system is  $100\text{cm}^3$  at 740 mm Atmospheric pressure .Calculate the work done during the expansion

### MATHS

- Find the sum to  $n$  terms of the sequence  $(x + \frac{1}{x})^2, (x^2 + \frac{1}{x^2})^2, (x^3 + \frac{1}{x^3})^2, \dots$
- If 9 harmonic means and 9 arithmetic means are inserted between 2 and 3 , then find the value of  $A + \frac{6}{H}$ . (Where A is any of the A.M.s and H is the corresponding H.M.)

- If H is the harmonic mean between P and Q, then find the value of  $\frac{H}{P} + \frac{H}{Q}$ .
- If  $a, b, c$  are distinct and are G.P. with common ratio  $r$  such that  $a, 2b, 3c$  form an A.P., then  $r$  equals
- If  $x$  is added to each of the numbers 3,9 and 21 so that the resulting numbers may be in G.P., then the value of  $x$  will be
- If the sides  $a, b,$  and  $c$  of a triangle ABC are in A.P. then  $\frac{b}{c}$  belongs to
- Three numbers are in G.P. whose sum is 70. If the extremes be each multiplied by 4 and the mean by 5, then they will form an A.P. The product of numbers is
- If the sum to infinity of the series  $1+2r + 3r^2+4r^3+\dots$  is  $\frac{9}{4}$ , then find the value of  $r$ .
- If  $S_n = nP + \frac{1}{2}n(n-1)Q$ , when  $S_n$  denotes the sum of the first  $n$  terms of an A.P., Then the common difference is
- If  $\log 2, \log(2^n-1)$  and  $\log(2^n+3)$  are in A.P., then  $n =$