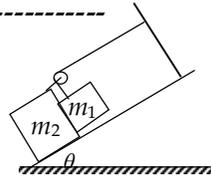


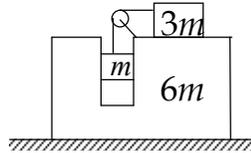
----- Level 2 -----

- Q1. For the arrangement shown in the figure find the acceleration of both the masses when the system is released from a state of rest. Consider the string portions to be parallel & perpendicular to the plane.

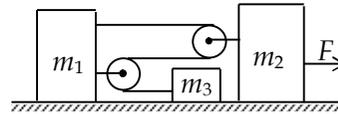


- Q2. A block of mass $6m$ rests on a horizontal floor. A block of mass $3m$ kept on it is attached to another block of mass m by an ideal string. m can move vertically in a slot cut in the block of mass $6m$. All the surfaces involved in the setup are frictionless.

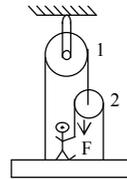
- (a) What is the vertical acceleration of m ?
 (b) What is the acceleration of $3m$?
 (c) What is the acceleration of $6m$?
 (d) What is the tension in the string?
 (e) What is the normal reaction between m & $6m$?



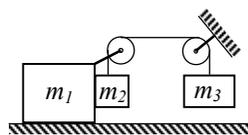
- Q3. In the figure shown the blocks and pulley are ideal and force of friction is absent. An external horizontal force F is applied as shown. Find the acceleration of the block of mass m_3 .



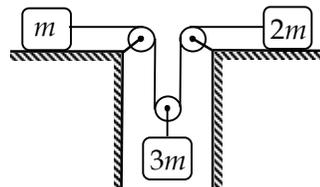
- Q4. With what force a man of mass 60 kg should pull on a rope in order to support the 20 kg platform on which he stands. What is the normal reaction between the man and the platform? What is the maximum weight of the platform that the man can support? What is the force exerted on the ceiling for the earlier case?



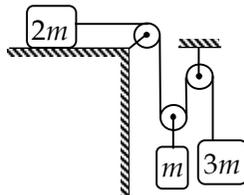
- Q5. For the arrangement shown in the figure the pulleys and the strings are all ideal. What will be the acceleration of the block m_1 and the tension in the string if the system is released from an initial state of rest?



- Q6. In the pulley block system shown, find the accelerations of the blocks and the tension in the string. Assume all surfaces to be frictionless. The masses of the blocks are m , $2m$ and $3m$ respectively.



- Q7. In the pulley block system shown, find the accelerations of the blocks and the tension in the string. Assume all surfaces to be frictionless. The masses of the blocks are given to be m , $2m$ and $3m$ respectively.



Shrinivas Academy (www.shrinivasacademy.com)

Physics Foundation Batch - IXth Standard.

Physics Tutorial Sheet No. 1.5 (Dynamics - Newton's Laws of Motion)

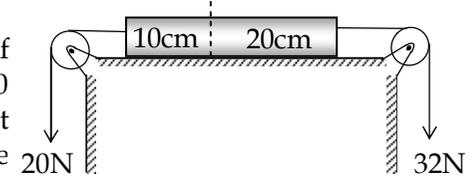
By Sanjeet Singh Adarsh (9822793601 sadarsh@iitbombay.org)

Take $g = 10 \text{ m/s}^2$ wherever necessary.

----- Level 1 -----

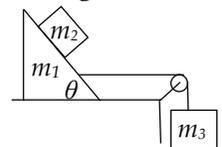
- Q1. A force of 100 N is used to lift up a body of mass 5 kg , initially at rest on the ground. The force acts on the body for 10 seconds. What is the initial acceleration, the maximum speed, the maximum height and the total time of motion of the body?

- Q2. Figure shows a uniform rod of length 30 cm having a mass of 3.0 kg . The string is pulled by constant forces of 20 N and 32 N . Find the force exerted by the 20 cm part of the rod on the 10 cm part. All surfaces are frictionless and the strings and the pulleys are light.

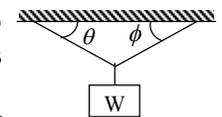


- Q3. An Atwood's machine has two masses m_1 & m_2 ($m_1 > m_2$). The system is held at rest such that the mass m_2 is resting on the ground with m_1 hanging. After the system being released, at what time the string should be cut such that the mass m_2 reaches a maximum height of h ?

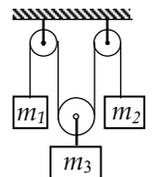
- Q4. For the system shown in the figure for what value of m_3 , m_2 does not move relative to the wedge m_1 when the system is released from an initial state of rest?



- Q5. A weight W hangs from a string that is tied to two other strings which are fastened to the ceiling as shown in the figure. The upper ropes make angles θ and ϕ with the horizontal. Find the tension in the strings.



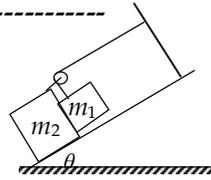
- Q6. For the system shown in the figure find the accelerations of all the masses when they are released from a state of rest. Consider all the pulleys and the strings to be ideal and all its portions vertical. What will be the tension in the string?



- Q7. Consider a simple Atwood's machine with two masses M each attached to the two ends of the ideal string. Now if a small mass m is carefully placed on one of the masses M , find the acceleration of the mass M , the force exerted by the pulley on its support and the force between m & M .

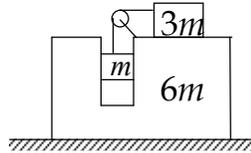
----- Level 2 -----

- Q1. For the arrangement shown in the figure find the acceleration of both the masses when the system is released from a state of rest. Consider the string portions to be parallel & perpendicular to the plane.

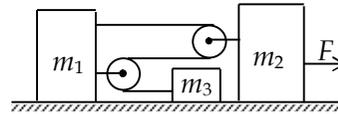


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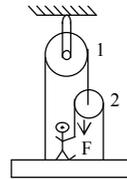
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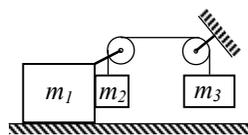
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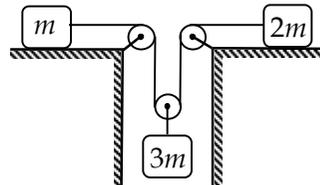
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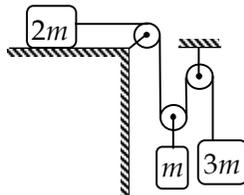
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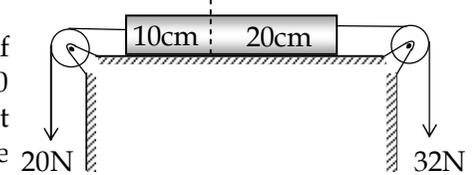
- Q7. In the pulley block system shown, find the accelerations of the blocks and the tension in the string. Assume all surfaces to be frictionless. The masses of the blocks are given to be m , $2m$ and $3m$ respectively.



----- Level 1 -----

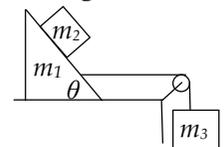
- Q1. A force of 100 N is used to lift up a body of mass 5 kg , initially at rest on the ground. The force acts on the body for 10 seconds. What is the initial acceleration, the maximum speed, the maximum height and the total time of motion of the body?

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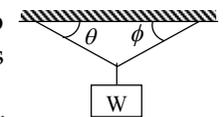


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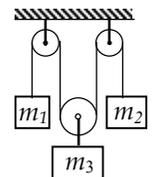
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