

**Vacation  
Home  
Work**

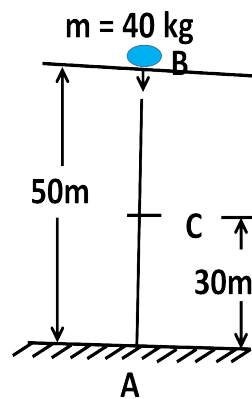
**Physics**

**Vacation Home Work : 23/07/2020**

**Class - X**

(Creative Questions given in this worksheet are important for Board Exams)

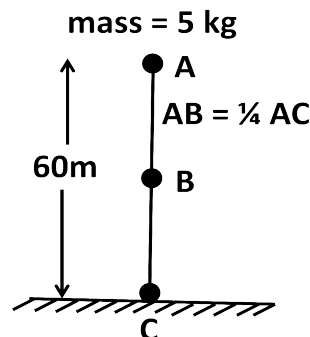
**1.**



Observe the above figure carefully and answer the following questions

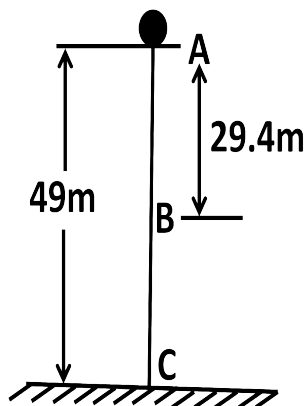
- Determine at which velocity the object will hit the ground.
- If the object is dropped freely from point B, the object follows the law of conservation of energy. Explain mathematically.

**2.** Observe the following figure carefully and answer the following questions



- a) If the time to lift the body at position A from the ground be 2 minutes, what power is used?
- b) Does the law of conservation of energy follow at position B and C in above stem? Evaluate mathematically.

**3.** A body of mass 100g is static at a point A. The body is released from that point.



- a) Determine the maximum Kinetic Energy of the body.
  - b) The total energy of the body at point A and B remains the same - explain with mathematical logic.
- 4.** An electric motor of power 15kw can lift 1000kg water on a roof of height 300m in 0.5 minutes.
- a) Calculate the efficiency of the motor.
  - b) Analyze mathematically the amount of energy used by the motor within that time if the efficiency is 75%.
- 5.** A pump is used to raise 1500 litres of water per minute from a 100m deep well. The efficiency of the pump is 70%.
- a) Determine the power of the pump.
  - b) Mathematically represent the amount of extra time required to raise 1500 litres of water if the efficiency of the pump is 60%.

- 6.** A motor of 15kw can lift 2 quintal water in 1 minute at a height of 300m.
- What is the effective power of the motor?
  - What will be the change in energy spent by the motor if the efficiency is increased by 5%? Analyze mathematically.
- 7.** Mass of Jony and Rony are respectively 40kg and 50kg. Jony and Rony can stair up 20 steps of 20cm height each in 10s and 18s respectively. [Acceleration due to gravity is  $9.8\text{ms}^{-2}$ ]
- Calculate work done by Rony.
  - Though Rony's work is more but Jony is ahead in power - evaluate the statement.
- 8.** Karim carries a load of 30kg through a distance of 500m in 5 minutes while Rahim carries the same load through the same distance in 10 minutes. [Take  $g=10\text{m/s}^2$ ]
- Calculate the force applied on the load.
  - Explain with mathematical logic whether the power will be double or not in comparison with one another.
- 9.** A toy car of mass 250gm is generated by an engine of 5J energy, at 1st trail it continues with  $4\text{m/s}$  uniform velocity and in the 2nd trail it starts from rest with uniform acceleration  $1\text{m/s}^2$  and travels 8m distance.
- Determine the required time to travel the distance in the 2nd trail mentioned in the above stem.
  - Is there any change of efficiency of the toy car in both trails? Explain with mathematical logic.
- 10.** An engine of power 1kw and efficiency 70% is used for lifting up water for a house of height 30m in 4 minutes. Another engine of power 2kw can lift up 1000kg of water at height of 10m in 2 minutes.
- Find out what amount of water the first engine can lift up in minutes.
  - Which engine will you select for the purpose of lifting water? Establish your selection.