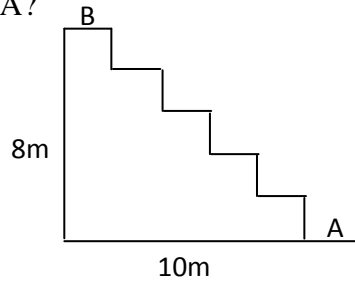



Work, energy & Power

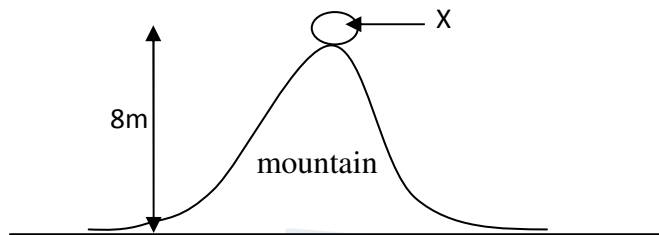
01. Which response contains a use of the elastic potential energy?
- 1) Shooting a stone with a catapult
  - 2) Rotating a turbine using a jet of water
  - 3) Lifting a vehicle using a jack
  - 4) Drawing water from a well using a pulley
02. In a certain body in motion has a kinetic energy of 18J. If the velocity of it is  $3\text{ms}^{-1}$ , the mass of the object is,
- 1) 4kg
  - 2) 6kg
  - 3) 8kg
  - 4) 12kg
03. When an object is thrown vertically upwards it travels a height of  $h$  under the acceleration due to gravity  $g$ . The velocity of the object  $V$  should be (assume no energy loss)
- 1)  $2gh$
  - 2)  $\sqrt{2gh}$
  - 3)  $\frac{gh}{2}$
  - 4)  $\frac{2h}{8}$
04. A ball of mass 12kg is dropped from a height of 10m. What is the potential energy and the kinetic energy of it. When it is 4m above the ground. (assume no energy loss)
- 1) 580J and 720J
  - 2) 1200J and 720J
  - 3) 580J and 1200J
  - 4) 720J and 580J
05. Gravitational potential energy of an rocket moving at a certain height is equal to its kinetic energy. The velocity of the rocket is  $100\text{ms}^{-1}$ . Height in between the rocket and the ground level is? ( $g=10\text{ms}^{-2}$ )
- 1) 500m
  - 2) 200m
  - 3) 1000m
  - 4) 400m
06. What are the standard international units of power work & energy?
- 1) Watt, Joule, Joule
  - 2) Joule, Watt, Joule
  - 3) Watt, Newton meter, Joule
  - 4) Watt, Newton, Joule
07. The kinetic energy of a moving object with mass 500g is 9J. What is the velocity of the object?
- 1)  $V = \sqrt{\frac{9 \times 2 \times 1000}{500}}$
  - 2)  $V = \sqrt{\frac{9}{500}}$
  - 3)  $V = \sqrt{\frac{9 \times 2}{500}}$
  - 4)  $V = \sqrt{\frac{9 \times 1000}{500}}$
08. A man carrying a mass of 20kg took 1 minute to move a distance of 12m. The power of the man is ( $g = 10\text{ms}^{-2}$ )
- 1)  $20\text{Js}^{-1}$
  - 2)  $40\text{Js}^{-1}$
  - 3)  $30\text{Js}^{-1}$
  - 4)  $50\text{Js}^{-1}$
09. An object was moved 600cm on a horizontal plane by exerting 15N force. The work done on the object is,
- 1) 1J
  - 2) 3J
  - 3) 4J
  - 4) 9J

10. Mass of a person is 30kg. He carries a 10kg mass. What is the work done when the person reach B from A?
- 1) 2400J
  - 2) 3200J
  - 3) 5400J
  - 4) 5120J



### Structured essay

01.A) An object called X of 15kg is placed at the peak of a mountain of 8m



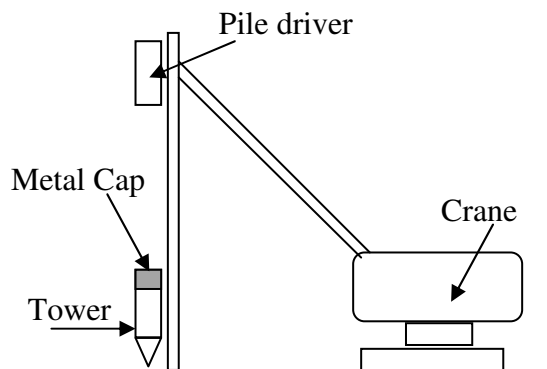
- i) What is the energy stored in the X object?  
.....
- ii) Name the type of energy that helps to bring the object to the top of the mountain?  
.....
- iii) Name two other forms of energy used to do work  
.....
- iv) What is the gravitational potential energy of the object?  
.....
- v) Write the energy transformation taking place when the object falls  
.....
- vi) If 40s were taken to take the object the peak of the mountain, calculate the power of the work  
.....

B. A man pushes a certain body for a distance of 20m exerting a force 300N. He takes 10s for it.

- i) Calculate the work done by him  
.....
- ii) What is the amount of energy used by him?  
.....
- iii) What is the type of energy used by him?  
.....
- iv) Find the power of him  
.....
- v) What is energy transformation occurs during this work  
.....

**Essay**

01. Pile driver is used in tower foundation construction.



- i) Mass of the pile driver lifted is 3000kg. Find its weight ( $g=10\text{ms}^{-2}$ )
- ii) What is the strategy taken to minimize the wastage of energy as the pile driver strikes the tower?
- iii) Crane lifts this pile driver 25m in 100 seconds.
  - a) Find the gravitational potentials energy stored in the pile driver when lifted?
  - b) What is the power of the crane?
- iv) Draw the velocity time graph for the motion of the pile driver till it falls on the tower from the moment it was dropped.

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