

Question 1

A student calculates the energy needed to raise the temperature of an aluminium block from 50 °C to 60 °C.

He then does an experiment to measure the energy used to do this.

Which statement about the measured energy is correct?

- A** The measured energy will be greater than the calculated energy because some energy is transferred to the surroundings.
- B** The measured energy will be greater than the calculated energy because the block absorbs energy from the surroundings.
- C** The measured energy will be less than the calculated energy because the mass of the block decreases as it gets warmer.
- D** The measured energy will be less than the calculated energy because the thermal capacity of the block is low.

Question 2

A car moves along a horizontal road. Its initial kinetic energy is 280 kJ. A constant resistive force of 200 N acts on the car. No other horizontal forces act on the car.

What is the kinetic energy of the car after it has travelled a distance of 300 m?

- A** 60 kJ **B** 80 kJ **C** 220 kJ **D** 340 kJ

Question 3

A woman of mass 50 kg has 81 J of kinetic energy.

What is her speed?

- A** 1.3 m/s **B** 1.6 m/s **C** 1.8 m/s **D** 3.2 m/s

Question 4

A child runs up a set of stairs four times. The time taken for each run is recorded.

Which time is measured when the child's useful power is greatest?

- A** 10 s **B** 20 s **C** 30 s **D** 40 s

Question 5

A stone is thrown vertically upwards at a speed of 5.0 m / s.

All of the energy initially in the kinetic store of the stone is transferred to its gravitational potential store when the stone reaches its maximum height.

Which equation gives the maximum height h reached by the stone?

A $h = \frac{9.8}{2 \times 5.0^2}$

B $h = \frac{5.0^2 \times 2}{9.8}$

C $h = \frac{5.0^2}{2 \times 9.8}$

D $h = \frac{2 \times 9.8}{5.0^2}$

Question 6

A woman of mass 50 kg has 81 J of kinetic energy.

What is her speed?

A 1.3m/s

B 1.6m/s

C 1.8m/s

D 3.2m/s

Question 7

An object of mass 4.5 kg is travelling at 7.0 m / s.

How much kinetic energy does the object have?

A 16 J

B 32 J

C 110 J

D 220 J

Question 8

A motor of power P exerts a force F on an object. The object moves a distance d during the time t that the force acts.

Which equation is used to calculate the time t ?

A $t = \frac{F}{Pd}$

B $t = \frac{Fd}{P}$

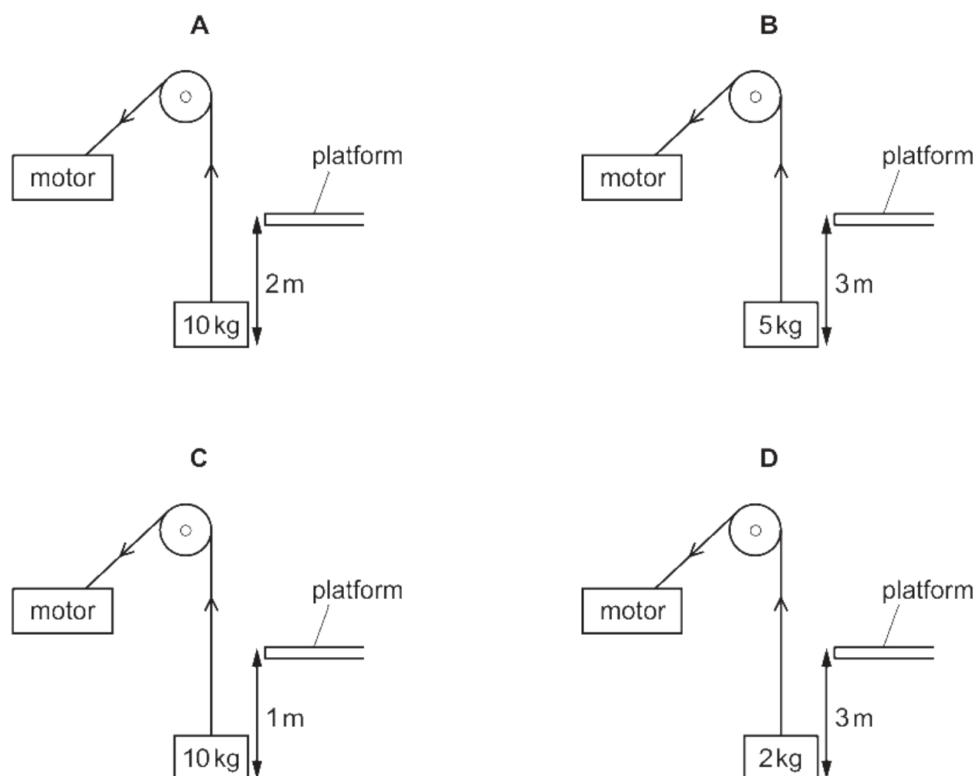
C $t = \frac{Pd}{F}$

D $t = \frac{P}{Fd}$

Question 9

A rope, connected to a pulley system and motor, is used to lift different objects through different distances. The time taken to lift each object is the same. The diagrams are not to scale.

Which motor requires the greatest power?

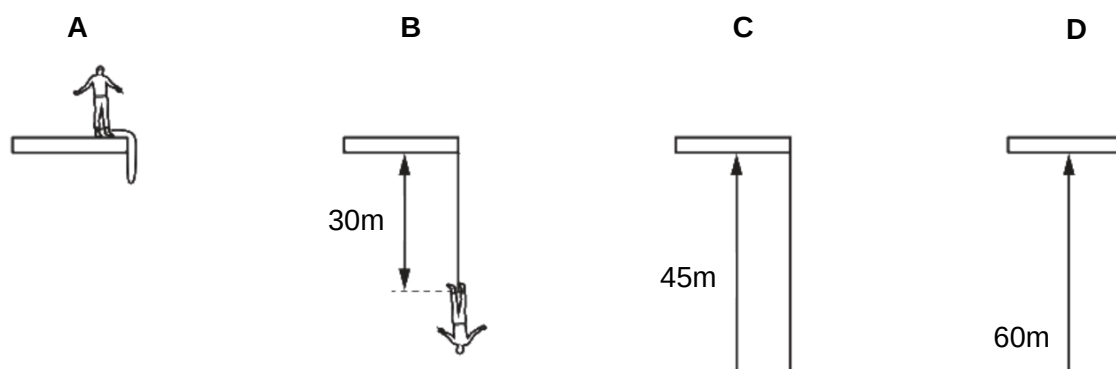


Question 10

A man, attached to an elastic cord, jumps from a platform. He falls 60 m before starting to rise. The length of the unextended cord is 30 m.

The diagrams show four successive stages in his fall.

In which position is elastic (strain) energy and kinetic energy present?



Question 11

An object has kinetic energy of 200 J.

A constant resultant force of 190 N is applied in the direction of its motion through a distance of 10 m.

What is the final kinetic energy of the object?

- A** 390 J **B** 1700 J **C** 2000 J **D** 2100 J