Question 1

A horizontal force pulls a box along a horizontal surface.

The box gains 30 J of kinetic energy and 10 J of thermal energy is produced by the friction between the box and the surface.

How much work is done by the force?

A 10 J **B** 20 J **C** 30 J **D** 40 J

Question 2

A car of mass 500 kg is moving at 10 m/s. The engine does work on the car and the speed increases to 16 m/s.

How much work is done by the engine to increase the speed of the car?

A 3000 J **B** 9000 J **C** 39000 J **D** 78000 J

Question 3

Which situation involves no work being done and no energy being transferred?

A a car skidding to a stop on a road

B a crane lifting a load

C a heavy load hanging from a strong bar

D a student dragging a big box over a rough floor

Question 4

A builder lifts 30 bricks from the ground onto a platform 2.0 m high.

Each brick has a mass of 4.0 kg.

What is the work done against gravity by the builder in lifting the bricks onto the platform?

A 80 J **B** 120 J **C** 240 J **D** 2400 J

Question 5

A scientist uses an electric motor to lift a load through a vertical distance of 2.0 m.

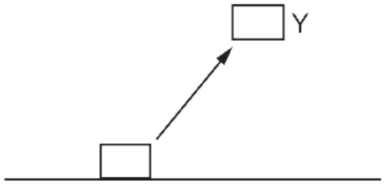
He then increases the input power to the motor and repeats the experiment. The efficiency of the motor does not change.

Which row correctly describes the effect that this has on the useful work done lifting the load and the time taken to lift it?

	work done	time taken
A	decreases	decreases
B	stays the same	decreases
C	decreases	stays the same
D	stays the same	stays the same

Question 6

A mass is lifted from rest on the ground to Y. There is no air resistance.



P is the increase in gravitational energy of the mass.

Q is the kinetic energy of the mass at Y.

Which expression is equal to the mechanical work done on the mass?

A $P + Q$ **B** $P - Q$ **C** $Q - P$ **D** $P \times Q$

Question 7

In some situations, a force does work.

Which set of conditions increases the quantity of work done by the force?

	magnitude of force	distance moved by the force
A	decreases	decreases
B	decreases	stays the same
C	increases	increases
D	stays the same	decreases

Question 8

A boy uses a rope to pull an object of mass m up a slope.

The rope is parallel to the slope.

The tension in the rope is constant and of value F.

The object moves a distance d along the slope and rises through a height h.

How much work is done by the boy?

A $F \times d$

B $F \times h$

C $m \times g \times h \times d$

D $m \times g \times h^2$

Question 9

The statements describe what happens when the power of a machine is increased.

1 The work done in a given time decreases.

2 The work done in a given time increases.

3 The time taken to do a given quantity of work decreases.

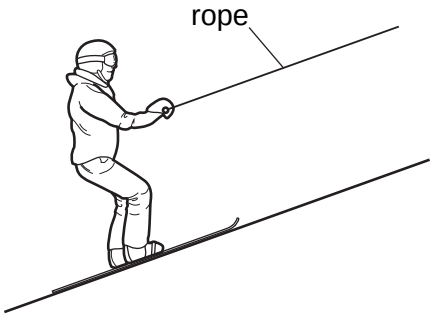
4 The time taken to do a given quantity of work increases.

Which statements are correct?

A 1 and 3 **B** 1 and 4 **C** 2 and 3 **D** 2 and 4

Question 10

A skier is pulled up a short straight slope at constant speed by a rope.



The tension in the rope is 100 N and there is a combined frictional and air resistance force of 20 N acting on the skier.

The slope is 10 m long and the skier rises 1.5 m vertically.

How much work is done by the rope pulling the skier up the slope?

A 120 J **B** 150 J **C** 1000 J **D** 1200 J