

Energy, Work & Power

Question Paper

Course	CIE IGCSE Physics
Section	1. Motion, Forces & Energy
Topic	Energy, Work & Power
Difficulty	Easy

Time Allowed 40

Score /33

Percentage /100

Question 1a

Fig. 4.1 shows an electric circuit.

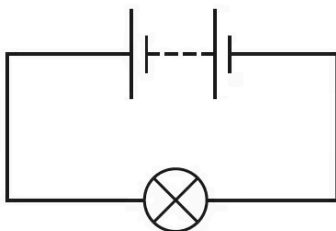


Fig. 4.1

An electric current transfers energy from the battery to the filament lamp.

State the two energy transfer pathways for the energy emitted by the filament lamp.

[2 marks]

Question 1b

State which store of energy in the battery is decreasing.

[1 mark]

Question 1c

Explain how the principle of conservation of energy applies to this circuit.

[1 mark]

Question 2

A drone is a machine that can fly. Fig. 4.1 shows a drone rising into the air, lifting a camera.



Fig. 4.1

The drone obtains energy from a battery of cells.

Complete the sequence of useful energy transfers as the drone rises into the air. One part is done for you.

..... store → kinetic store → store

[2 marks]

Question 3a

A bouncy ball is dropped from a height of 1.65 m onto a smooth wooden floor, where it bounces, reaching a height of 1.43 m.

The bouncy ball has a mass of 0.07 kg

Complete the energy transfers taking place when

- (i) the ball is falling towards the floor

..... energy store → kinetic energy store [1]

- (ii) the ball hits the floor and deforms

kinetic energy store → energy store [1]
[2 marks]

Question 3b**Extended tier only**

Calculate the energy in the gravitational potential store of the ball just before it is dropped.

energy =
[2 marks]

Question 3c**Extended tier only**

Calculate the speed at which the bouncy ball hits the floor.

For the purposes of this calculation, you can assume there is no air resistance.

speed =
[4 marks]

Question 3d

The bounce height is smaller than the height the ball was dropped from.

Explain why this is the case.

[3 marks]

Question 4a

Identify the unit for energy.

Tick **one** box.

☐ N

☐ K

☐ J

[1 mark]

Question 4b

State why work done is equal to energy transferred.

[1 mark]

Question 4c

Fork-lift trucks are used to move crates in warehouses. Fig. 1.1 shows a crate being lifted to high shelf.

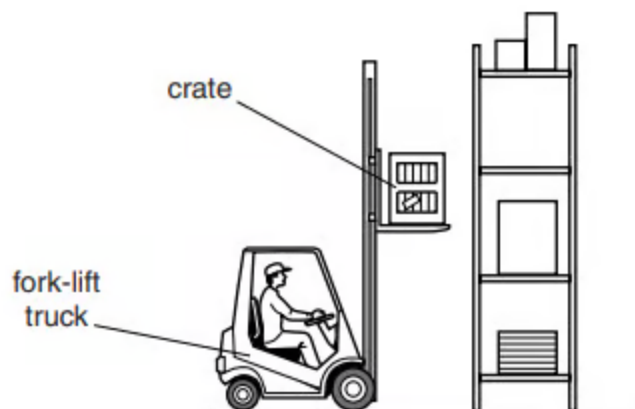


Fig. 1.1

The fork-lift truck lifts a crate of 450 N to a shelf that is 3.9 m above the ground.

Calculate the work done to lift the crate.

work done =
[2 marks]

Question 4d**Extended tier only**

The total energy input for the fork-lift truck to lift the crate is 2500 J

Calculate the efficiency of the fork-lift truck.

efficiency =
[3 marks]

Question 5a

A group of students want to measure their power output when climbing a ladder.

Student A has a mass of 54 kg and takes 15 s to climb the ladder which has a vertical height of 1.8 m.

Calculate the work done in raising the student's body mass as they climb the ladder.

work =
[2 marks]

Question 5b

Calculate the power output of Student A in raising their body mass up the ladder.

power output =
[2 marks]

Question 5c**Extended tier only**

Student A's body is only 17% efficient when climbing the ladder.

Calculate the total power input of the student to climb the ladder.

power input =
[3 marks]

Question 5d

State the energy transfer taking place as student A climbs the ladder.

[2 marks]



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