YOUR SCIENCE ONLINE
yourscienceonline.com

Year 10–11 • Cambridge IGCSE Physics 0625

Energy, Work & Power



Topic Practice Paper

Exam-style questions on energy stores, work done, kinetic and potential energy, power, efficiency and energy resources. 45 minutes.

Energy stores | Work done | KE & GPE | Power | Efficiency | Resources

KEY IDEAS IN THIS PAPER **TAKE g = 9.8 N/kg** **CORE + EXTENDED**

Name: _____ Class: _____

Date set: _____ Date due: _____

What's inside

Question 1	Energy stores on a roller-coaster	**8 marks**
Question 2	Work done	**6 marks**
Question 3	GPE and kinetic energy [Extended]	**8 marks**
Question 4	Power	**9 marks**
Question 5	Efficiency [Extended]	**5 marks**
Question 6	Energy resources	**9 marks**

Instructions

- Answer all questions and show your working.
- You need a pen, pencil, ruler and calculator.
- [Extended] parts: Core candidates may skip (Core total: 30).
- Marks for each question are shown in [ ].

Total score

/ 45

© Your Science Online • yourscienceonline.com • For personal and single-classroom use only. Please do not share or resell.

Energy, Work and Power – Topic Practice Paper

Cambridge IGCSE Physics 0625 style. Answer all questions and show your working. Take g = 9.8 N/kg. Parts marked **[Extended]** are for Extended candidates; Core candidates may leave them out.

Question 1 — Energy stores on a roller-coaster

Fig. 1.1 shows a roller-coaster car at three points, A, B and C, on its track. The car starts from rest at A.

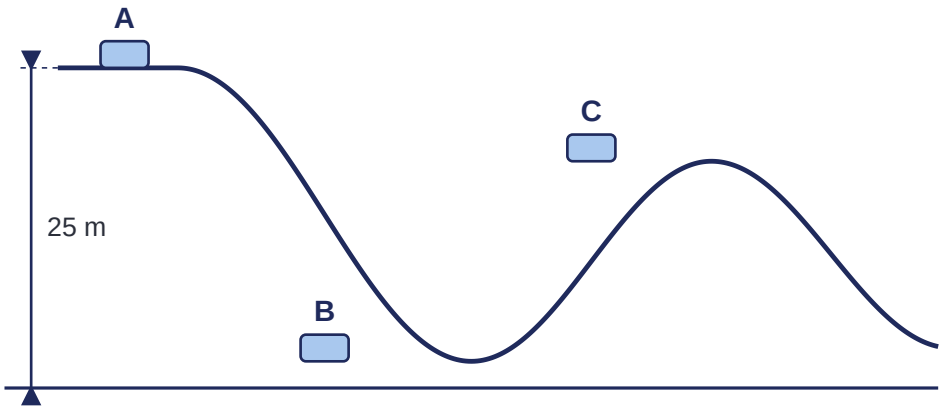

Fig. 1.1

(a) State the energy store of the car that is largest at A. **[1]**

.....

(b) State the energy store of the car that increases as the car moves from A to B. **[1]**

.....

(c) At the end of the ride, brakes stop the car. State the energy store that the kinetic energy of the car is transferred to, and how it is transferred. **[2]**

.....

.....

(d) State the principle of conservation of energy. **[2]**

.....

.....

(e) Explain why the track after A can never rise higher than A, even though energy is conserved. **[2]**

.....

.....

Total for this question: _____ / 8

Question 2 Work done

A worker pushes a box along a floor at a constant speed. She uses a horizontal force of 40 N and the box moves 6.0 m.

(a) State the equation that links work done, force and distance moved. **[1]**

.....

(b) Calculate the work done by the worker. **[2]**

.....

.....

work done = ... J

(c) State the amount of energy transferred by the worker as she pushes the box. **[1]**

.....

(d) The worker then lifts the box onto a shelf. The weight of the box is 150 N and the shelf is 1.2 m above the floor. Calculate the work done against gravity. **[2]**

.....

.....

work done = ... J

Total for this question: _____ / 6

Question 3 Gravitational potential and kinetic energy [Extended]

A student drops a ball of mass 0.20 kg from a height of 1.8 m, as shown in Fig. 3.1.

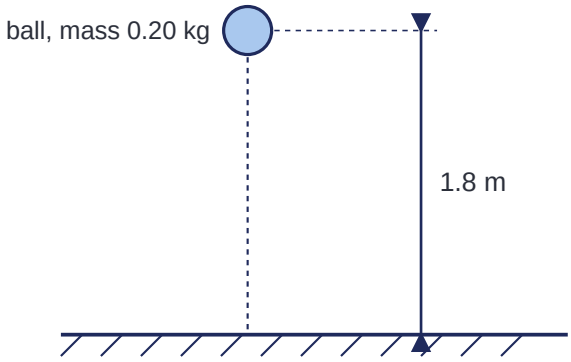

Fig. 3.1

(a) Calculate the decrease in the gravitational potential energy of the ball as it falls to the ground. **[2]**

.....

.....

decrease in energy = ... J

(b) Air resistance can be ignored. Calculate the speed of the ball just before it hits the ground. **[3]**

.....

.....

.....

speed = ... m/s

(c) A car of mass 1200 kg is travelling at 15 m/s. Calculate its kinetic energy. **[2]**

.....

.....

kinetic energy = ... J

(d) The speed of the car doubles. State the number of times larger its kinetic energy becomes. **[1]**

.....

Total for this question: _____ / 8

Question 4 Power

A student of weight 600 N runs up a flight of stairs. The top of the stairs is 3.0 m higher than the bottom. He takes 4.0 s.

(a) Define *power*. **[1]**

.....

(b) Calculate the work done by the student in lifting his weight to the top of the stairs. **[2]**

.....

.....

work done = ... J

(c) Calculate the useful power of the student. **[2]**

.....

.....

power = ... W

(d) A second student of the same weight walks up the same stairs in 10 s. Compare the work done and the power of the two students. **[2]**

.....

.....

(e) A 2.0 kW electric kettle is switched on for 3.0 minutes. Calculate the energy transferred by the kettle. **[2]**

.....

.....

energy = ... J

Total for this question: _____ / 9

Question 5 Efficiency [Extended]

An electric motor lifts a load. Table 5.1 shows the energy transfers during one lift.

energy	amount / J
electrical energy supplied to the motor	500
energy transferred to the gravitational potential store of the load	350
energy transferred to the thermal store of the motor	120
energy transferred to the surroundings as sound	30

Table 5.1

(a) Calculate the efficiency of the motor. **[2]**

.....

.....

efficiency = ... %

(b) Suggest **one** way of increasing the efficiency of the motor. **[1]**

.....

(c) The lift takes 5.0 s. Calculate the useful power output of the motor. **[2]**

.....

.....

useful power = ... W

Total for this question: _____ / 5

Question 6 Energy resources

Electricity can be generated from many different energy resources.

(a) Complete Table 6.1 by writing **renewable** or **non-renewable** next to each energy resource. **[2]**

energy resource	renewable or non-renewable
coal	
wind	
natural gas	
hydroelectric	
nuclear fission	

Table 6.1

(b) State **one** advantage and **one** disadvantage of using wind turbines to generate electricity. **[2]**

advantage

.....

disadvantage

.....

(c) Describe how a coal-fired power station generates electricity. Use the words **turbine** and **generator** in your answer. **[3]**

.....

.....

.....

.....

(d) **[Extended]** State the original source of the energy for most of the energy resources on Earth, and the process that releases this energy. **[2]**

.....

.....

END OF PAPER **Total for this question: _____ / 9**