IGCSE · PHYSICS 0625 · FOR EXAMINATION IN 2026, 2027 AND 2028

Topic 1 · Motion, forces and energy

The largest topic on the syllabus and the one that carries the most marks in the real papers. Measurement, motion graphs, Newton's laws, moments, momentum, energy and pressure.

SUGGESTED TIME	TOTAL MARKS	QUESTIONS	MULTIPLE CHOICE
50 minutes	**41**	**10**	**6**

SECTION	**1 · Motion, forces and energy**
IN THE FORMAT OF	Papers 1 and 2 (multiple choice), Papers 3 and 4 (theory), Paper 6 (alternative to practical)
ROUTES	Core only — 5 questions, 13 marks. Core and Supp. — the whole paper, 10 questions, 41 marks. Every question is tagged in the left margin.
DEMAND	**Recall 1 · Routine 5 · Demanding 3 · Discriminating 1** *Pitched at the board's own level, not above it. Multiple choice is mostly one step, with a couple of two-step items and one that rewards the candidate who does not take the obvious route. Structured questions open on a 1-mark recall and close on an explanation or a suggestion worth two marks — the marks real candidates most often drop.*
SYLLABUS POINTS	1.1 · 1.2 · 1.3 · 1.4 · 1.5.1 · 1.5.2 · 1.5.3 · 1.6 · 1.7.1 · 1.7.2 · 1.7.3 · 1.7.4 · 1.8

INSTRUCTIONS

- Answer all questions in the spaces provided.
- Show your working. Method marks are awarded even where the final answer is wrong.
- Give your answers to a sensible number of significant figures, with a unit.
- The mark scheme for this paper follows the last question.

> *Written by GioPhysics from the published syllabus. These are practice papers in the style of Cambridge IGCSE Physics 0625; they are not Cambridge papers, contain no past-paper questions, and the official syllabus and specimen materials remain the authority.*
>
> Cambridge IGCSE Physics 0625 syllabus — https://www.cambridgeinternational.org/Images/697209-2026-2028-syllabus.pdf

THE PAPER

Topic 1 · Motion, forces and energy

Answer all questions. 41 marks in 50 minutes.

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1 CORE

MULTIPLE CHOICE · RECALL · 1.1 **[1]**

Which pair contains only vector quantities?

A distance and displacement

B energy and power

C mass and weight

D velocity and weight

Answer ☐

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2 CORE

MULTIPLE CHOICE · ROUTINE · 1.2 **[1]**

A cyclist travels 100 m in a straight line in 20 s, then stops at traffic lights for 10 s. What is the average speed over the whole 30 s?

A 0 m/s

B 3.3 m/s

C 5.0 m/s

D 10 m/s

Answer ☐

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3 CORE

MULTIPLE CHOICE · ROUTINE · 1.4 **[1]**

A rectangular metal block measures 2.0 cm × 3.0 cm × 5.0 cm and has a mass of 240 g. What is its density?

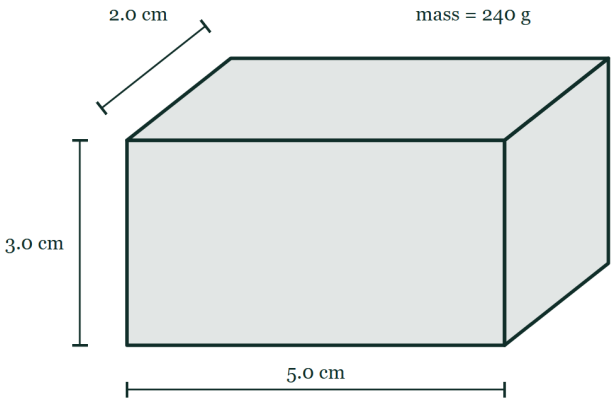

Fig. 3.1 *An oblique drawing of a solid rectangular metal block. The front face is marked 5.0 cm along its lower edge and 3.0 cm up its left-hand edge, and the edge receding into the page is marked 2.0 cm. The block carries the label mass = 240 g.*

A 0.13 g/cm³

B 8.0 g/cm³

C 24 g/cm³

D 7200 g/cm³

Answer

4 MULTIPLE CHOICE · ROUTINE · 1.5.2 **[1]**

CORE

A uniform beam is pivoted at its centre. A weight of 4.0 N hangs 0.80 m from the pivot on the left-hand side. A weight of 8.0 N is hung on the right-hand side so that the beam balances. How far from the pivot is the 8.0 N weight?

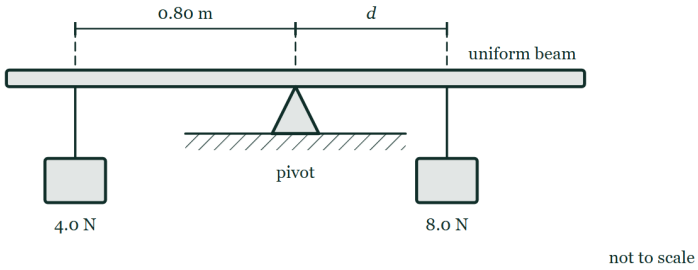

Fig. 4.1 *A uniform beam rests on a pivot standing on the ground, the pivot placed at the centre of the beam. A 4.0 N weight hangs from the beam at a point 0.80 m to the left of the pivot, and an 8.0 N weight hangs to the right of the pivot at a distance marked d. Both distances are measured along the beam from the pivot. The drawing is not to scale.*

A 0.20 m

B 0.40 m

C 0.80 m

D 1.6 m

Answer

5 SUPP.

MULTIPLE CHOICE · DEMANDING · 1.7.1 **[1]**

A ball of mass 0.50 kg is dropped from a height of 1.8 m and rebounds to a height of 1.2 m. How much energy is transferred away from the ball during the bounce?

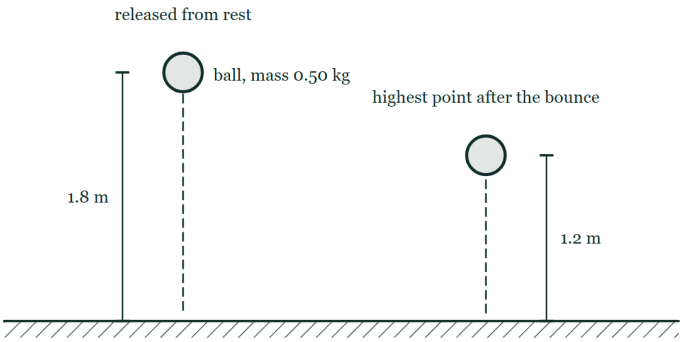

Fig. 5.1 *A ball of mass 0.50 kg is drawn twice above level ground. On the left it is at the point of release, with a dimension line marking 1.8 m from the ground up to the ball. On the right it is at the highest point reached after the bounce, with 1.2 m marked in the same way. Dashed vertical lines show the path down and the path back up.*

A 0.60 J

B 2.9 J

C 5.9 J

D 8.8 J

Answer ☐

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6 SUPP.

MULTIPLE CHOICE · ROUTINE · 1.8 **[1]**

A diver is 15 m below the surface of a lake. The density of the water is 1000 kg/m³. What is the increase in pressure on the diver caused by the water above her?

A 1.5×10^3 Pa

B 1.5×10^4 Pa

C 1.5×10^5 Pa

D 1.5×10^6 Pa

Answer ☐

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7 STRUCTURED · DEMANDING · 1.2 · 1.5.1 **[9]**

SUPP.

A car of mass 1200 kg starts from rest on a straight, level road. It reaches a speed of 24 m/s in 8.0 s. The forward force produced by the engine during this time is 4500 N.

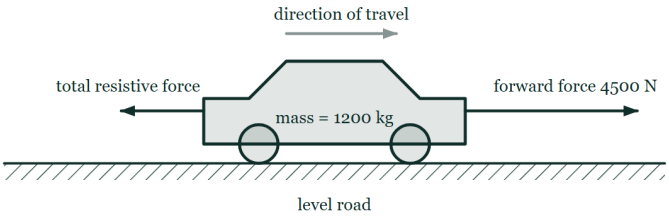

Fig. 7.1 *A car on a straight, level road, labelled mass = 1200 kg, with a faint arrow above it showing the direction of travel to the right. A long horizontal arrow points forwards from the front of the car and is labelled forward force 4500 N. A shorter horizontal arrow points backwards from the rear of the car and is labelled total resistive force, with no value given.*

(a) STATE **[1]**

State the equation linking acceleration, change in velocity and time taken.

(b) CALCULATE **[2]**

Calculate the acceleration of the car.

(c) CALCULATE **[2]**

Calculate the resultant force acting on the car.

(d) DETERMINE **[2]**

Determine the total resistive force acting on the car during this time.

(e) EXPLAIN **[2]**

The car later travels along the same road at a constant speed of 30 m/s. Explain, in terms of the forces acting, why the speed is constant.

8 STRUCTURED · DISCRIMINATING · 1.6 · 1.7.1 **[9]**

SUPP.

Trolley A has a mass of 0.80 kg and moves along a straight, level track at 2.5 m/s. It collides with trolley B, of mass 1.2 kg, which is stationary. After the collision the two trolleys move off joined together. Friction is negligible.

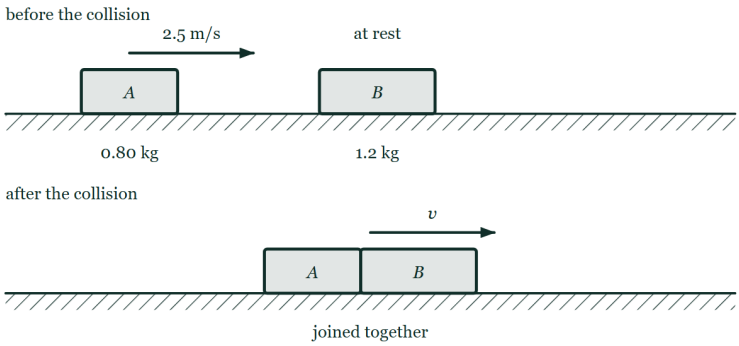

Fig. 8.1 *Two panels, one above the other. In the upper panel, labelled before the collision, trolley A of mass 0.80 kg stands on a level track with an arrow showing it moving to the right at 2.5 m/s towards trolley B of mass 1.2 kg, which is at rest. In the lower panel, labelled after the collision, the two trolleys are drawn joined together and moving to the right with a speed marked v.*

(a) STATE **[2]**

State the principle of conservation of momentum.

(b) CALCULATE **[3]**

Calculate the speed of the joined trolleys immediately after the collision.

(c) SHOW (THAT) **[3]**

Show that kinetic energy is not conserved in this collision, and determine how much kinetic energy is transferred to other stores.

(d) SUGGEST **[1]**

Suggest what happens to the kinetic energy that is not accounted for after the collision.

9 STRUCTURED · ROUTINE · 1.7.3 · 1.7.4 **[8]**

SUPP.

A wind turbine generates electricity for a school. Over a period of 60 s, the moving air delivers 900 kJ of energy to the turbine blades. The electrical output of the turbine during this time is 9.0 kW.

(a) STATE **[2]**

State two renewable energy resources other than wind.

(b) CALCULATE **[2]**

Calculate the input power delivered to the blades by the moving air.

(c) CALCULATE **[2]**

Calculate the efficiency of the turbine.

(d) EXPLAIN **[2]**

Explain why the efficiency of the turbine can never reach 100%.

10 CORE

PRACTICAL SKILLS · DEMANDING · 1.1 · 1.4 **[9]**

A student determines the density of a small irregularly shaped stone. She has an electronic balance, a measuring cylinder, water and a length of thread. The stone fits easily inside the measuring cylinder.

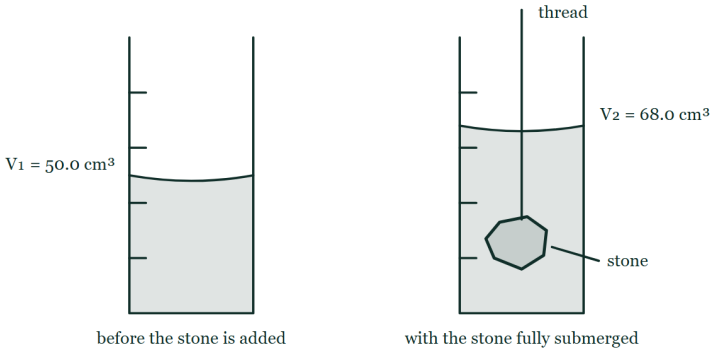

Fig. 10.1 *Two measuring cylinders drawn side by side, each with graduations up the wall and a curved meniscus. The first holds water alone, its surface at the 50.0 cm³ mark. The second holds the same water with the stone lowered in on a thread that runs up and out of the cylinder; the stone lies fully submerged near the base and the surface now stands at the 68.0 cm³ mark.*

The student's readings

Quantity	Reading
mass of stone m	47.6 g
volume of water alone V_1	50.0 cm³
volume of water and stone V_2	68.0 cm³

(a) DESCRIBE **[3]**

Describe how the student should use the measuring cylinder and thread to obtain the readings V_1 and V_2 accurately.

(b) CALCULATE **[3]**

Calculate the density of the stone. Give your answer to an appropriate number of significant figures.

(c) SUGGEST **[3]**

The stone is porous and slowly absorbs water. Suggest how this affects the value obtained for the density, and suggest one improvement to the method.

MARK SCHEME

Topic 1 · Motion, forces and energy — mark scheme

One line per mark, as an examiner would award them. A note under a part is the error that part is set to catch.

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1 CORE

MULTIPLE CHOICE · RECALL · 1.1 **[1]**

Which pair contains only vector quantities?

KEY **D** **velocity and weight**

A and C each pair a scalar with a vector, which is the trap: distance and mass have no direction. B is two scalars. Only D is a vector twice over.

A01

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2 CORE

MULTIPLE CHOICE · ROUTINE · 1.2 **[1]**

A cyclist travels 100 m in a straight line in 20 s, then stops at traffic lights for 10 s. What is the average speed over the whole 30 s?

KEY **B** **3.3 m/s**

C is the speed while moving — the commonest wrong answer, because it ignores that average speed is total distance over total time. D halves the time as well as reading only the first stage.

A02

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3 CORE

MULTIPLE CHOICE · ROUTINE · 1.4 **[1]**

A rectangular metal block measures 2.0 cm × 3.0 cm × 5.0 cm and has a mass of 240 g. What is its density?

KEY **B** **8.0 g/cm³**

A inverts the formula. C divides by only one dimension. D multiplies mass by volume instead of dividing, which is the slip a candidate working too fast makes.

A02

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4 CORE

MULTIPLE CHOICE · ROUTINE · 1.5.2 **[1]**

A uniform beam is pivoted at its centre. A weight of 4.0 N hangs 0.80 m from the pivot on the left-hand side. A weight of 8.0 N is hung on the right-hand side so that the beam balances. How far from the pivot is the 8.0 N weight?

KEY **B** **0.40 m**

D doubles the distance instead of halving it — the error of a candidate who has memorised that the moments are equal but not thought about which way the ratio runs.

A02

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5 SUPP.

MULTIPLE CHOICE · DEMANDING · 1.7.1 **[1]**

A ball of mass 0.50 kg is dropped from a height of 1.8 m and rebounds to a height of 1.2 m. How much energy is transferred away from the ball during the bounce?

KEY **B** **2.9 J**

C and D are mgh for the full drop and for the two heights added together. The question is about the difference in height, 0.60 m, and only B uses it. A is the height itself, not an energy.

A02

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6 SUPP. MULTIPLE CHOICE · ROUTINE · 1.8 **[1]**

A diver is 15 m below the surface of a lake. The density of the water is 1000 kg/m³. What is the increase in pressure on the diver caused by the water above her?

KEY **C** **1.5 × 10⁵ Pa**

All four are the same digits, so the item tests whether the candidate can carry a power of ten through ρgh rather than whether they know the formula. B drops the factor of g.

AO2

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7 SUPP. STRUCTURED · DEMANDING · 1.2 · 1.5.1 **[9]**

A car of mass 1200 kg starts from rest on a straight, level road. It reaches a speed of 24 m/s in 8.0 s. The forward force produced by the engine during this time is 4500 N.

(a) STATE · AO1 **[1]**

State the equation linking acceleration, change in velocity and time taken.

1 a = Δv / Δt, in words or symbols, with symbols defined or standard

(b) CALCULATE · AO2 **[2]**

Calculate the acceleration of the car.

1 a = 24 / 8.0

2 a = 3.0 m/s² (unit required)

(c) CALCULATE · AO2 **[2]**

Calculate the resultant force acting on the car.

1 F = ma = 1200 × 3.0

2 F = 3600 N (unit required)

(d) DETERMINE · AO2 **[2]**

Determine the total resistive force acting on the car during this time.

1 recognises resistive force = forward force − resultant force

2 4500 − 3600 = 900 N

The part that separates grades. Candidates who have treated 4500 N as the resultant in (c) cannot recover here, which is exactly what the structure is testing.

(e) EXPLAIN · AO1 **[2]**

The car later travels along the same road at a constant speed of 30 m/s. Explain, in terms of the forces acting, why the speed is constant.

1 the resultant force on the car is zero

2 because the forward force from the engine is equal in size to the total resistive force (and opposite in direction)

"There is no force" earns nothing. The marks are for a resultant of zero produced by two forces that balance.

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8 STRUCTURED · DISCRIMINATING · 1.6 · 1.7.1 **[9]**

SUPP.

Trolley A has a mass of 0.80 kg and moves along a straight, level track at 2.5 m/s. It collides with trolley B, of mass 1.2 kg, which is stationary. After the collision the two trolleys move off joined together. Friction is negligible.

(a) STATE · AO1 **[2]**

State the principle of conservation of momentum.

1 the total momentum of a system (of interacting bodies) before an event equals the total momentum after it

2 provided no external resultant force acts

(b) CALCULATE · AO2 **[3]**

Calculate the speed of the joined trolleys immediately after the collision.

1 momentum before = 0.80 × 2.5 = 2.0 kg m/s

2 total mass after = 0.80 + 1.2 = 2.0 kg

3 v = 2.0 / 2.0 = 1.0 m/s

(c) SHOW (THAT) · AO2 **[3]**

Show that kinetic energy is not conserved in this collision, and determine how much kinetic energy is transferred to other stores.

1 E_k before = ½ × 0.80 × 2.5^2 = 2.5 J

2 E_k after = ½ × 2.0 × 1.0^2 = 1.0 J

3 1.5 J transferred away, so kinetic energy is not conserved

Momentum is conserved and kinetic energy is not: the pairing is the whole point of the question, and candidates who assume both are conserved lose all three marks.

(d) SUGGEST · AO1 **[1]**

Suggest what happens to the kinetic energy that is not accounted for after the collision.

1 transferred to the internal (thermal) energy store of the trolleys and surroundings, and/or emitted as sound

9 SUPP.

STRUCTURED · ROUTINE · 1.7.3 · 1.7.4 **[8]**

A wind turbine generates electricity for a school. Over a period of 60 s, the moving air delivers 900 kJ of energy to the turbine blades. The electrical output of the turbine during this time is 9.0 kW.

(a) STATE · AO1 **[2]**

State two renewable energy resources other than wind.

1 any one of: solar / hydroelectric / tidal / wave / geothermal / biofuel

2 a second, different one from the same list

Named fuels such as "gas" or "nuclear" score zero — both are non-renewable.

(b) CALCULATE · AO2 **[2]**

Calculate the input power delivered to the blades by the moving air.

1 P = E / t = 900 000 / 60

2 P = 15 000 W = 15 kW

(c) CALCULATE · AO2 **[2]**

Calculate the efficiency of the turbine.

1 efficiency = useful output power / total input power = 9.0 / 15

2 = 0.60 or 60%

(d) EXPLAIN · AO1 **[2]**

Explain why the efficiency of the turbine can never reach 100%.

1 some energy is always transferred to non-useful stores — friction in the bearings and gearbox heats the surroundings, and sound is emitted

2 and the air must still be moving after it passes the blades, so it keeps some kinetic energy

The second marking point is the one that separates a good answer. "Energy is lost" alone is not creditworthy: energy is not destroyed, it is transferred to a store that is not useful.

10 CORE

PRACTICAL SKILLS · DEMANDING · 1.1 · 1.4 **[9]**

A student determines the density of a small irregularly shaped stone. She has an electronic balance, a measuring cylinder, water and a length of thread. The stone fits easily inside the measuring cylinder.

(a) DESCRIBE · AO3 **[3]**

Describe how the student should use the measuring cylinder and thread to obtain the readings V_1 and V_2 accurately.

1 part-fill the cylinder with water and record the level V_1, reading the bottom of the meniscus with the eye level with the surface

2 lower the stone in gently on the thread so that no water splashes out and the stone is fully submerged

3 record the new level V_2 once the water is still

"Eye level with the meniscus" is the mark examiners report as most often missed, and it is worth as much as the method itself.

(b) CALCULATE · AO2 **[3]**

Calculate the density of the stone. Give your answer to an appropriate number of significant figures.

1 $V = V_2 - V_1 = 68.0 - 50.0 = 18.0\ \text{cm}^3$

2 $\rho = m / V = 47.6 / 18.0$

3 $\rho = 2.64\ \text{g/cm}^3$ (2.6 g/cm³ also accepted; unit required)

(c) SUGGEST · AO3 **[3]**

The stone is porous and slowly absorbs water. Suggest how this affects the value obtained for the density, and suggest one improvement to the method.

1 water enters the stone, so the rise in level $V_2 - V_1$ is smaller than the true volume of the stone

2 the calculated density is therefore too high

3 improvement: read V_2 immediately on submerging, or seal the stone first, or use a displacement can

Two marks are for the direction of the error, not just its existence. Answering "it makes it inaccurate" scores one at most.

THE CHEAPEST MARKS ON ANY PAPER

What the command words are asking for

Every board publishes these and marks to them. A candidate who explains where the question said state has spent four minutes earning one mark; one who states where it said explain has earned none.

Calculate	Work out from given facts, figures or information.
Define	Give the precise meaning.
Describe	State the points of a topic; give characteristics and main features.
Determine	Establish an answer using the information available.
Estimate	Suggest an approximate value.
Explain	Set out purposes or reasons; make relationships evident; give why and/or how.
Give	Produce an answer from a given source or recall.
Identify	Name, select or recognise.
Show (that)	Provide structured evidence that leads to a given result.
State	Express in clear terms.
Suggest	Apply knowledge and understanding to situations where there is a range of valid responses in order to make proposals.

WHAT IS BEING TESTED

IGCSE assessment objectives

Every candidate sits two theory papers and one practical-skills paper. Core takes Papers 1 and 3 and is capped at grade C; Extended takes Papers 2 and 4 and reaches A*. Both then take either Paper 5 (practical test) or Paper 6 (alternative to practical), which carries 20% either way. Theory papers give you no formula sheet.

AO1
11 MARKS · 27%
QUALIFICATION 50%

Knowledge with understanding

Recall, describe, explain and use physics ideas, terminology, instruments and conventions.

AO2
24 MARKS · 59%
QUALIFICATION 30%

Handling information and problem-solving

Locate and interpret information, translate between forms, calculate, reason, and apply physics to unfamiliar situations.

AO3
6 MARKS · 15%
QUALIFICATION 20%

Experimental skills and investigations

Plan, use apparatus, record and present observations, analyse, evaluate, and suggest improvements.

> *Written by GioPhysics from the published syllabus. These are practice papers in the style of Cambridge IGCSE Physics 0625; they are not Cambridge papers, contain no past-paper questions, and the official syllabus and specimen materials remain the authority.*
>
> Cambridge IGCSE Physics 0625 syllabus — https://www.cambridgeinternational.org/Images/697209-2026-2028-syllabus.pdf