Cambridge Assessment International Education

Cambridge IGCSE™

PHYSICS **0625/12**

Paper 1 Multiple Choice (Core) **February/March 2025**

45 minutes

You must answer on the multiple choice answer sheet.

You will need: Multiple choice answer sheet
Soft clean eraser
Soft pencil (type B or HB is recommended)

INSTRUCTIONS

- There are **forty** questions on this paper. Answer **all** questions.
- For each question there are four possible answers **A**, **B**, **C** and **D**. Choose the **one** you consider correct and record your choice in soft pencil on the multiple choice answer sheet.
- Follow the instructions on the multiple choice answer sheet.
- Write in soft pencil.
- Write your name, centre number and candidate number on the multiple choice answer sheet in the spaces provided unless this has been done for you.
- Do **not** use correction fluid.
- Do **not** write on any bar codes.
- You may use a calculator.
- Take the weight of 1.0 kg to be 9.8 N (acceleration of free fall = 9.8 m / s^2).

INFORMATION

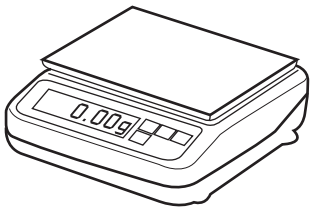
- The total mark for this paper is 40.
- Each correct answer will score one mark.
- Any rough working should be done on this question paper.

This document has **16** pages. Any blank pages are indicated.

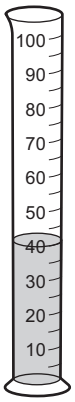
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1 A student is asked to find the volume of a small irregularly shaped piece of rock.

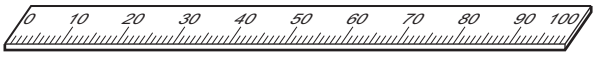
The student has the following apparatus available.



balance



measuring cylinder containing water



ruler

Which apparatus must the student use to find the volume of the small piece of rock?

A balance and ruler

B ruler only

C balance and measuring cylinder

D measuring cylinder only

2 A digital stop-clock measures time in minutes and seconds.

The stop-clock reads 00:50 when it is started (i.e. 00 minutes 50 seconds).

It reads 02:10 when it is stopped.

What is the shortest possible time that has passed between starting and stopping the stop-clock?

A 1 minute 06 seconds

B 1 minute 20 seconds

C 2 minutes 10 seconds

D 3 minutes 00 seconds

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3 Four students are instructed to find the time it takes for a ball bearing to fall through a vertical height of 1.0 m.

Each student uses a different procedure.

Which student follows the correct procedure?

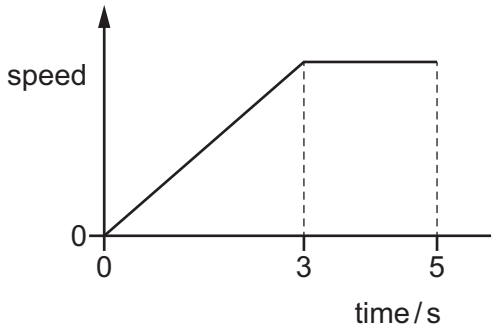
A The student measures the time taken for the ball to fall 1.0 m five times. He then adds the times taken together and divides by five.

B The student measures the time taken for the ball to fall 1.0 m five times. He then multiplies the times taken together and divides by five.

C The student measures the time taken for the ball to fall 2.0 m. He then divides the time taken by two.

D The student measures the time taken for the ball to fall 2.0 m five times. He then adds the times taken together and divides by ten.

4 The graph shows the motion of a car for a 5-second period.



Which row shows a time when the car is at rest and a time when it is moving at a constant speed?

	the car is at rest at	the car is moving at a constant speed at
A	0.0 s	2.0 s
B	0.0 s	4.0 s
C	4.0 s	0.0 s
D	4.0 s	2.0 s

5 Which property of an object is a gravitational force acting on its mass?

A density

B surface area

C volume

D weight

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6 A stone has a weight of 5.7 N.

The gravitational field strength g is 9.8 N / kg.

What is the mass of the stone?

A 0.58 kg **B** 5.7 kg **C** 56 kg **D** 550 kg

7 Which equation is correct?

A $\text{mass} = \dfrac{\text{acceleration}}{\text{force}}$

B mass = density × volume

C $\text{mass} = \dfrac{\text{force}}{\text{impulse}}$

D $\text{mass} = \dfrac{\text{kinetic energy}}{\text{velocity}^2}$

8 What is meant by the moment of a force?

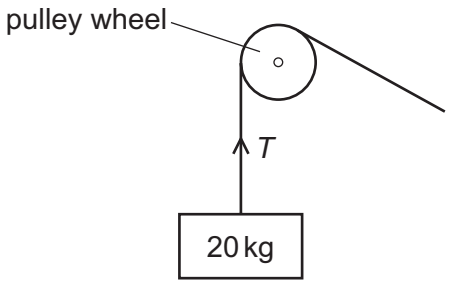
A the magnitude of the force

B the work done by the force

C the time for which the force acts

D the turning effect of the force

9 A mass of 20 kg is held stationary by a rope passing over a frictionless pulley.



What is the force T in the rope?

A 10 kg **B** 20 kg **C** 100 N **D** 200 N

10 Which equation relates the work done W on an object by a force F when it moves a distance d?

A $d = WF$ **B** $d = \dfrac{F}{W}$ **C** $F = \dfrac{d}{W}$ **D** $F = \dfrac{W}{d}$

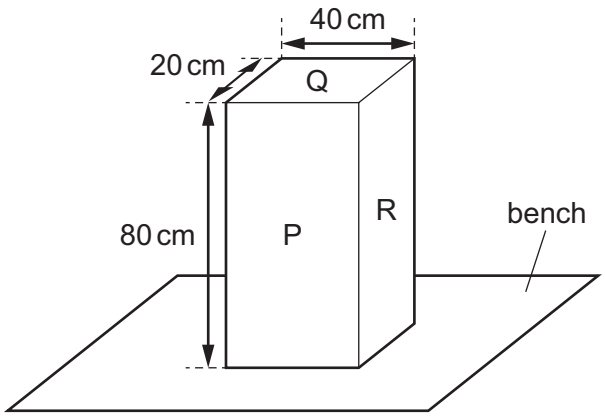
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11 A boy produces an average useful power output of 60 W as he rides his bicycle for 2.0 minutes.

How much useful energy does he transfer?

A 0.50 J **B** 30 J **C** 120 J **D** 7200 J

12 The diagram shows a solid block resting on a bench. The dimensions of the block are shown.



On which labelled surface should the block rest to produce the smallest pressure on the bench?

A P

B Q

C R

D P, Q and R produce the same pressure

13 A skier is standing still on a flat area of snow.



The total weight of the skier is 550 N. The total area of his skis in contact with the ground is $0.015\,m^2$.

What is the pressure exerted on the ground by the skier?

A $0.83\,N/m^2$ **B** $8.3\,N/m^2$ **C** $3700\,N/m^2$ **D** $37\,000\,N/m^2$

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14 A force acts on an area to produce a pressure.

Which changes produce the same pressure?

A doubling the area and doubling the force

B doubling the area and halving the force

C doubling the area and making the force four times bigger

D halving the area and doubling the force

15 The diagram shows a cylinder containing oxygen under high pressure.



The temperature of the cylinder and the oxygen decreases.

Which statement describes what happens to the pressure in the cylinder and gives the reason why the pressure changes?

A The pressure decreases because the oxygen particles move faster.

B The pressure decreases because the oxygen particles move more slowly.

C The pressure increases because the oxygen particles move faster.

D The pressure increases because the oxygen particles move more slowly.

16 Which statement describes what happens during solidification?

A Particles begin to move around each other easily.

B Particles stop moving around each other.

C The temperature of the particles continues to decrease during solidification.

D The temperature of the particles continues to increase during solidification.

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17 Solids expand the .....1..... and the average separation between molecules is the .....2..... .

Which words complete the sentence about the expansion of solids when they are heated, relative to liquids and gases?

	1	2
A	least	greatest
B	least	smallest
C	most	greatest
D	most	smallest

18 A girl blows some air into a party balloon and ties a knot to seal the air in the balloon.

The girl holds the sealed balloon above a hot convector heater.

She observes that the volume of the balloon increases significantly.

Which statement identifies the cause of this increase in volume?

A The air in the balloon contracts.

B The air in the balloon expands.

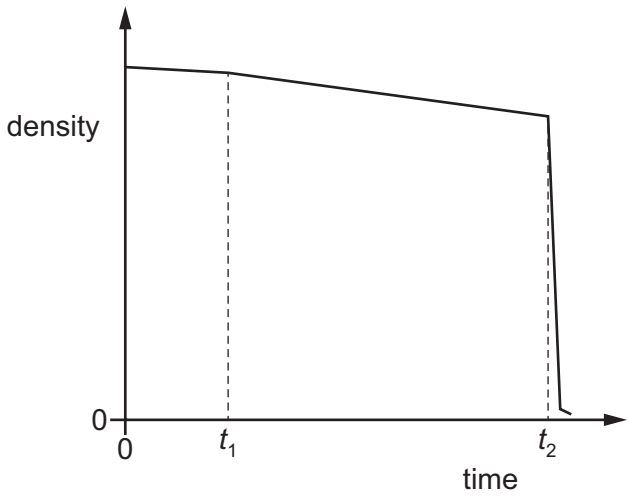
C The material of the balloon contracts.

D The material of the balloon expands.

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[Turn over

19 The graph shows what happens to the density of a substance as its temperature changes over time.



Which term describes the change of state taking place at time t_2?

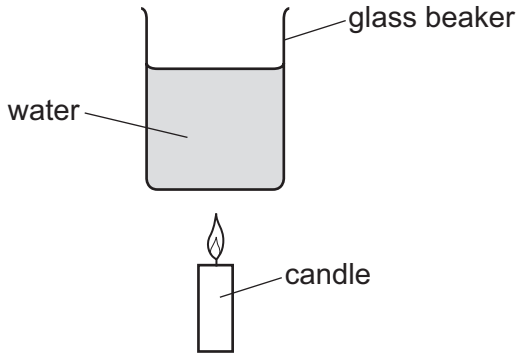
A melting

B freezing

C condensation

D boiling

20 A candle is used to heat some water in a glass beaker.



What is the **main** method of heat transfer through the glass and within the water?

	through the glass	within the water
A	conduction	conduction
B	conduction	convection
C	convection	conduction
D	convection	convection

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21 Which equation enables the speed of a wave to be calculated?

A speed = amplitude × frequency

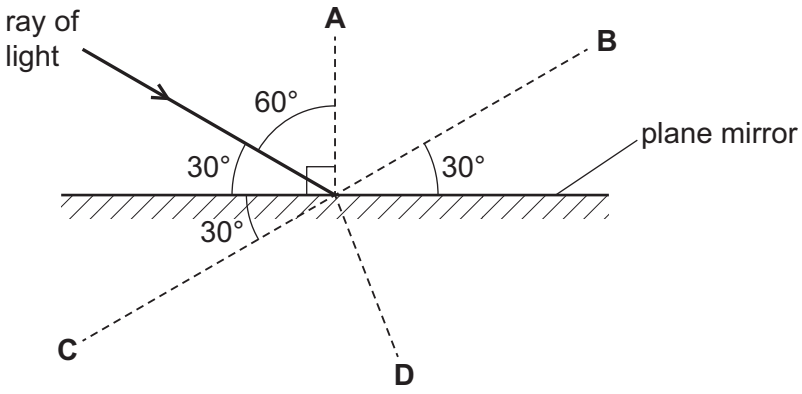
B speed = amplitude × wavelength

C speed = frequency × wavelength

D $\text{speed} = \dfrac{\text{frequency}}{\text{wavelength}}$

22 A ray of light is incident on the surface of a plane mirror, as shown.

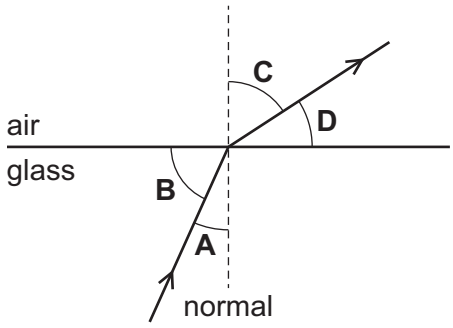
In which position is the reflected ray?



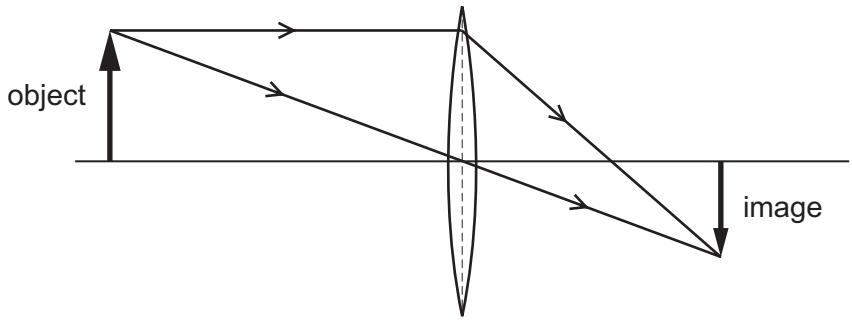
23 The diagram shows a ray of light passing from glass to air.

The dotted line labelled ‘normal’ is a line drawn perpendicular to the surface of the glass.

What is the angle of refraction?



24 The diagram shows how a converging lens forms an image of an object.



Which description of the image formed by the lens is correct?

A real, inverted and diminished

B real, upright and enlarged

C virtual, inverted and diminished

D virtual, upright and enlarged

25 Which row describes the image viewed in a plane mirror?

	type of image	image size
A	real	enlarged
B	real	same size
C	virtual	enlarged
D	virtual	same size

26 The table gives the range of frequencies of three types of electromagnetic radiation.

type of radiation	range of frequencies / Hz
radio	3×10^4 to 3×10^9
visible light	4×10^{14} to 8×10^{14}
X-rays	3×10^{16} to 3×10^{19}

Which type of electromagnetic radiation has a frequency of 4×10^{15} Hz?

A gamma radiation

B infrared radiation

C microwave radiation

D ultraviolet radiation

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27 An athlete hears a starting pistol fire 1.5 seconds after she sees a puff of smoke from the pistol. The sound and the smoke are made at the same time. The starting pistol is 450 metres away from the athlete.

What is the speed of sound calculated from this observation?

A 150 m / s **B** 300 m / s **C** 330 m / s **D** 675 m / s

28 A plotting compass is placed close to the pole of a magnet with poles marked X and Y. The N pole of the plotting compass points to pole X, as shown.



Pole Y of the magnet is then placed close to another magnet with poles marked P and Q, as shown. The magnets repel each other.



magnets repel

Which row is correct?

	pole X	pole P
A	N	N
B	N	S
C	S	N
D	S	S

29 Why are electrical cables often made from copper?

A Copper contains free electrons and is a good conductor.

B Copper contains free electrons and is a good insulator.

C Copper contains free protons and is a good conductor.

D Copper contains free protons and is a good insulator.

30 There is a current I in a resistor. The potential difference (p.d.) across the resistor is V.

What does the product IV represent?

A the charge flowing through the resistor

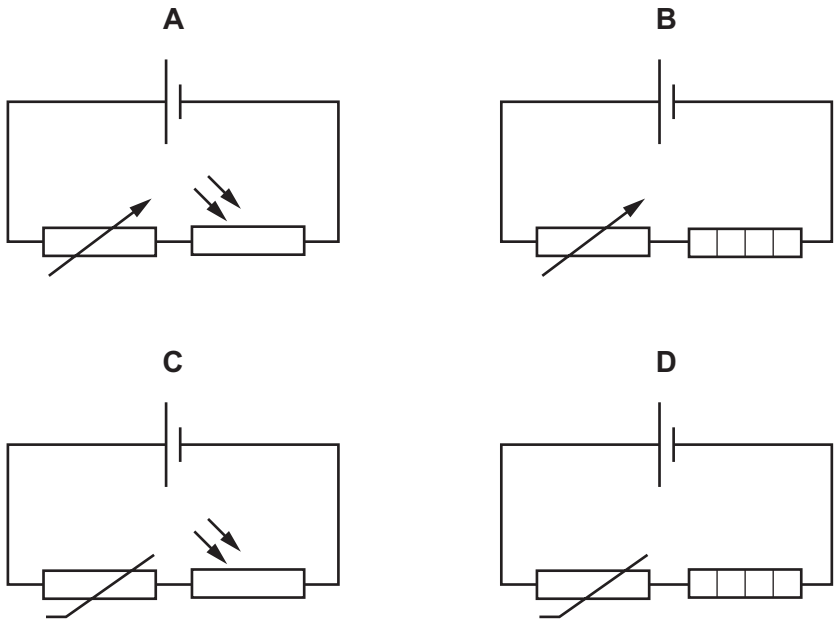
B the energy transferred by the resistor

C the power dissipated by the resistor

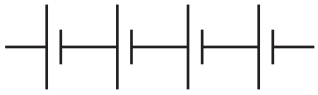
D the resistance of the resistor

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31 Which circuit contains a thermistor and a heater?



32 Four 2.0 V cells are connected together in series to make a battery, as shown.

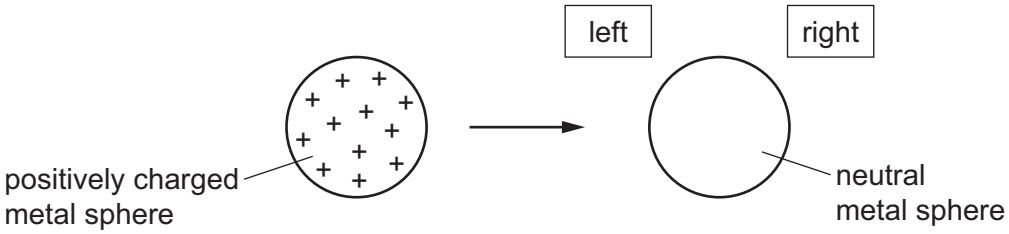


What is the combined electromotive force (e.m.f.) of the battery?

A 0.50 V **B** 2.0 V **C** 6.0 V **D** 8.0 V

33 An isolated metal sphere is positively charged.

It is then brought near to another isolated metal sphere that is neutral.



What happens to the charges on the neutral sphere as the positively charged sphere is brought close to it?

A Some positive charges move to the left and some negative charges move to the right.

B Some positive charges move to the right and some negative charges move to the left.

C Some positive charges move to the right, but the negative charges do **not** move.

D The positive charges do **not** move, but some negative charges move to the left.

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34 The potential difference (p.d.) across a car headlamp is 12 V. The current in the lamp is 2.5 A.

How much energy is transferred by the lamp in 1.0 hour?

A 1800 J **B** 1800 W **C** 108 000 J **D** 108 000 W

35 A copper wire rests in a uniform magnetic field.

Which change causes an induced electromotive force (e.m.f.) in the wire?

A connecting the wire to a power supply

B connecting the wire to earth

C heating the wire

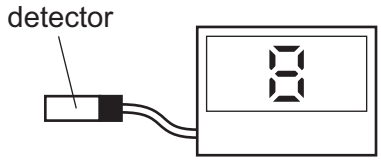
D moving the wire

36 An element has two isotopes.

Which row compares the nucleus of one atom of each isotope?

	the charge on each nucleus	the mass of each nucleus
A	different	different
B	different	the same
C	the same	different
D	the same	the same

37 In a laboratory, a radiation detector is connected to a counter which shows a reading for the count rate due to background radiation.



Which unit is count rate measured in?

A counts / s

B minutes / count

C coulombs / minute

D amperes / s

38 Which statement about alpha, beta and gamma emissions is correct?

A Alpha-particles are lighter than beta-particles.

B Beta-particles are **not** deflected by magnetic fields.

C Gamma rays are more penetrating than alpha-particles and beta-particles.

D Gamma rays are more ionising than alpha-particles and beta-particles.

39 What is an effect of ionising nuclear radiation on living things?

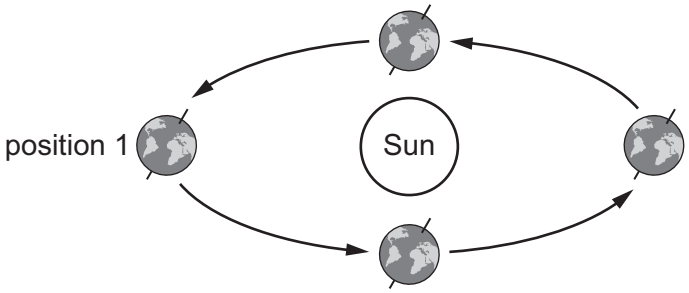
A cell mutation

B electric shock

C internal cooling of body cells

D broken bones

40 The diagram shows the Earth orbiting the Sun.



Which row identifies and explains the correct season in the northern hemisphere on the Earth in position 1?

	season	explanation
A	summer	the northern hemisphere tilts away from the Sun
B	summer	the northern hemisphere tilts towards the Sun
C	winter	the northern hemisphere tilts away from the Sun
D	winter	the northern hemisphere tilts towards the Sun

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