Cambridge Assessment International Education

Cambridge IGCSE™

PHYSICS **0625/23**

Paper 2 Multiple Choice (Extended) **May/June 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.

1 Which quantity can be measured using a ruler?

A the distance travelled by a toy train in one second

B the temperature of a toy train

C the time taken for a toy train to travel one metre

D the volume of a toy train

2 A car is driven from one town to another town along a road that is **not** straight.

The driver of the car divides the total distance travelled by the total time taken.

Which quantity does the driver calculate?

A the acceleration of the car

B the average speed of the car

C the kinetic energy of the car

D the velocity of the car

3 Which quantity can be determined from the area under a speed–time graph?

A acceleration

B distance

C speed

D velocity

4 Students are asked for a statement about the weight of an object.

Three of the statements are listed.

1 The weight is the quantity of matter in the object.

2 The weight is the effect of a gravitational field on the object.

3 The weight is the force of attraction between the object and the Earth.

Which statements describe the weight of the object?

A 1, 2 and 3 **B** 1 and 2 only **C** 1 and 3 only **D** 2 and 3 only

5 Samples of three different liquids have equal masses.

The volumes of the samples are 190 cm^3, 200 cm^3 and 235 cm^3.

The liquids are poured into a large measuring cylinder and the liquids form three separate layers because they do **not** mix.

What are the readings on the measuring cylinder at the two boundaries between the samples?

A 190 cm^3 and 390 cm^3

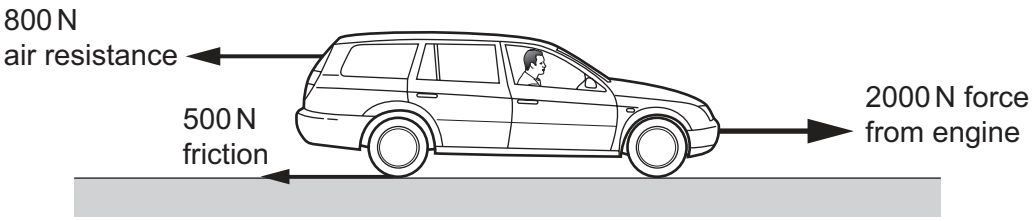
B 190 cm^3 and 425 cm^3

C 235 cm^3 and 425 cm^3

D 235 cm^3 and 435 cm^3

6 A car moves along a level road.

The diagram shows all of the horizontal forces acting on the car.



Which statement is correct?

A The car is slowing down.

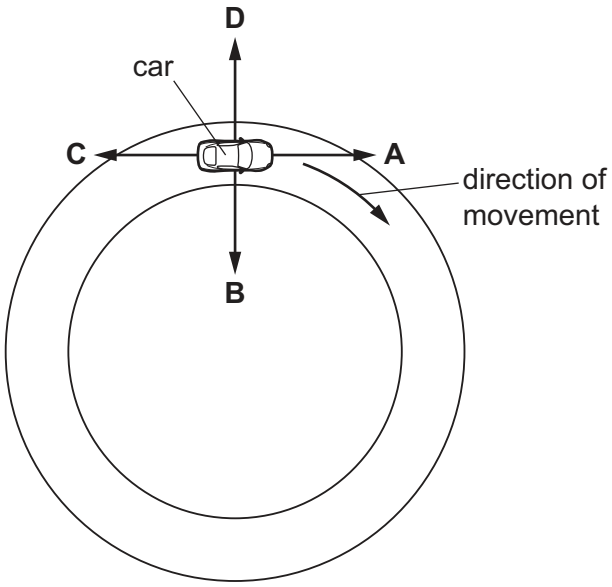
B The car is speeding up.

C The car is moving at a constant speed.

D The car is moving backwards.

7 A car is travelling around a circular track at a constant speed, as shown.

In which direction is the resultant force on the car?



8 A railway truck of mass 8000 kg moves with a velocity of 1.0 m / s to the right.

It collides with a railway truck of mass 12 000 kg moving at 2.0 m / s to the left.

The two trucks become joined to each other when they collide and move off together.

What is the velocity of the two trucks after the collision?

A 1.6 m / s to the left

B 0.80 m / s to the left

C 0.80 m / s to the right

D 1.6 m / s to the right

9 A stone is dropped from a bridge which is 22 m above a river.

What is the speed of the stone when it hits the water?

A 15 m / s **B** 21 m / s **C** 220 m / s **D** 430 m / s

10 Which row describes the particle structure of a gas?

	distance between the particles	motion of the particles
A	close together	vibrating
B	close together	random
C	far apart	vibrating
D	far apart	random

11 The particles of a gas in a container of fixed volume gain energy in the kinetic store.

Which effect does this have on the gas?

A Both the pressure and the temperature of the gas increase.

B Only the temperature of the gas increases.

C Neither the pressure nor the temperature of the gas increases.

D Only the pressure of the gas increases.

12 Gas particles exert a pressure when they collide with the walls of a container.

Which statement about the gas particles is correct?

A They experience a change in force, which results in a pressure equal to momentum $\times$ area.

B They experience a change in force, which results in a pressure equal to $\frac{\text{momentum}}{\text{area}}$.

C They experience a change in momentum, which results in a pressure equal to force $\times$ area.

D They experience a change in momentum, which results in a pressure equal to $\frac{\text{force}}{\text{area}}$.

13 A solid changes into a liquid.

Which term describes this change in state?

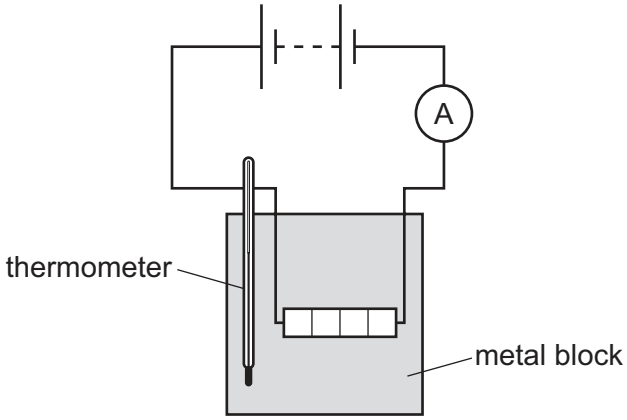
A boiling

B condensation

C freezing

D melting

14 The diagram shows some of the apparatus used to determine the specific heat capacity of a metal block.



Which additional pieces of apparatus are required to find the specific heat capacity?

A stop-watch, voltmeter and balance

B resistor, stop-watch and ruler

C ruler, balance and force meter

D voltmeter, thermistor and insulation

15 Four different surfaces are at the same high temperature.

Which surface emits thermal radiation at the slowest rate?

	colour of surface	texture of surface	surface area / cm^2
A	black	dull	10
B	black	dull	100
C	white	shiny	10
D	white	shiny	100

16 An object has a constant temperature.

Which statement is correct?

A There is **no** energy transfer to or from the object.

B The rate at which the object receives energy is the same as the rate at which it transfers energy away.

C The rate at which the object receives energy is smaller than the rate at which it transfers energy away.

D The rate at which the object receives energy is greater than the rate at which it transfers energy away.

17 Which row correctly describes light waves?

	wave type	direction of vibration
A	longitudinal	parallel to direction of wave travel
B	longitudinal	perpendicular to direction of wave travel
C	transverse	parallel to direction of wave travel
D	transverse	perpendicular to direction of wave travel

18 A narrow beam of light consists of two waves of different wavelengths.

The beam of light hits a sharp edge.

Which effect will be seen beyond the sharp edge?

A Both waves continue along the same straight line as before.

B Both waves bend sharply and continue along a new straight line.

C The wave of longer wavelength bends round the sharp edge more than the wave of shorter wavelength.

D The wave of shorter wavelength bends round the sharp edge more than the wave of longer wavelength.

19 An object is placed 30 cm in front of a plane mirror.

Which statement describes the image of the object?

A The image is the same size as the object and 30 cm from the object.

B The image is the same size as the object and 60 cm from the object.

C The image is smaller than the object and 30 cm from the object.

D The image is smaller than the object and 60 cm from the object.

20 Which statement about total internal reflection at a glass–air boundary is correct?

A The angle of incidence inside the glass must be equal to the critical angle.

B The angle of incidence inside the glass must be less than the critical angle.

C The critical angle is proportional to the refractive index of the glass.

D The speed of light in glass must be less than the speed of light in air.

[Turn over

21 What is the speed of radio waves in a vacuum and what is the speed of gamma rays in a vacuum?

	speed of radio waves	speed of gamma rays
A	less than 3.0×10^8 m/s	less than 3.0×10^8 m/s
B	less than 3.0×10^8 m/s	more than 3.0×10^8 m/s
C	3.0×10^8 m/s	3.0×10^8 m/s
D	more than 3.0×10^8 m/s	more than 3.0×10^8 m/s

22 A student makes a sound in front of a large wall.

She hears an echo at time t after making the sound.

The speed of sound in air is v.

Which expression is used to calculate the distance between the student and the wall?

A $v \times t$ **B** $v \div t$ **C** $(v \times t) \div 2$ **D** $(v \div t) \div 2$

23 What is a compression?

A a point in a longitudinal wave where the particles of the medium are close together

B a point in a longitudinal wave where the particles of the medium are far apart

C a point in a transverse wave where the particles of the medium are close together

D a point in a transverse wave where the particles of the medium are far apart

24 Which row describes the magnetic field around a weak magnet?

	direction of field	spacing of field lines
A	north pole to south pole	close together
B	north pole to south pole	far apart
C	south pole to north pole	close together
D	south pole to north pole	far apart

25 A 0.60 m length of resistance wire with a diameter of 0.25 mm has a resistance of 6.0 Ω.

A second piece of resistance wire of the same material with a diameter of 0.50 mm also has a resistance of 6.0 Ω.

What is the length of the second piece of wire?

A 0.15 m **B** 0.30 m **C** 1.20 m **D** 2.40 m

26 A circuit contains a cell with an electromotive force (e.m.f.) of 2.0 V. The current in the circuit is 2.0 A.

How much energy is transferred by the cell in 2.0 minutes?

A 2.0 J **B** 4.0 J **C** 8.0 J **D** 480 J

27 What is the electromotive force (e.m.f.) of a cell?

A the charge that passes through the cell per unit time

B the energy supplied per unit charge as charge passes through the cell

C the total charge flowing through the cell

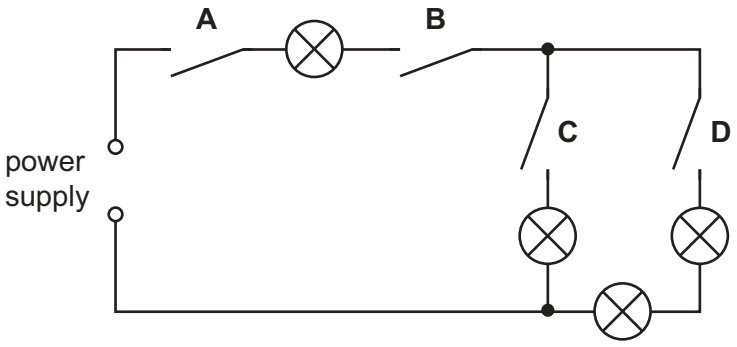
D the total energy stored in the cell

28 Four lamps and four switches are connected to a power supply, as shown.

When all the switches are closed, all the lamps are lit.

When one of the switches is then opened, only **one** lamp goes out.

Which switch is opened?



29 In which mains electric wires are the fuse and the switch placed?

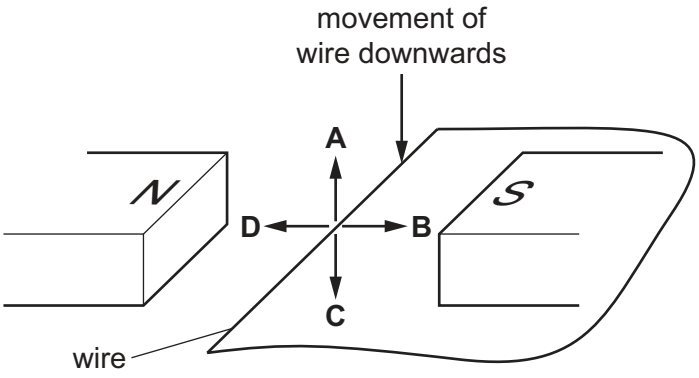
	fuse	switch
A	earth	live
B	live	live
C	live	neutral
D	neutral	neutral

30 The diagram shows a wire moving downwards in a magnetic field between two magnetic poles.

There is an induced current in the wire because of the movement.

The induced current produces a force on the wire.

In which direction is this force?



31 When the generator shown rotates, there is an a.c. electromotive force (e.m.f.) across the resistor between points P and Q.

Diagram 1 shows the position of the coil at time $t = 0$.

The coil rotates clockwise. At time t_1, the coil position is horizontal, as shown in diagram 2.

diagram 1

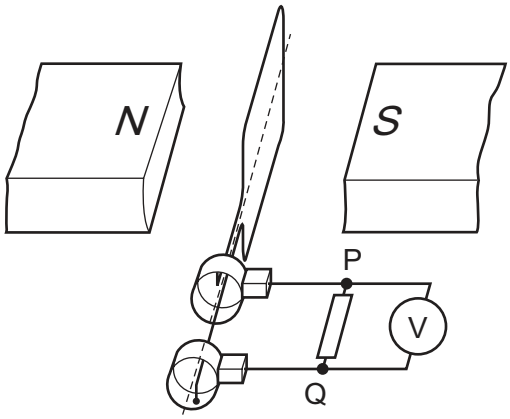
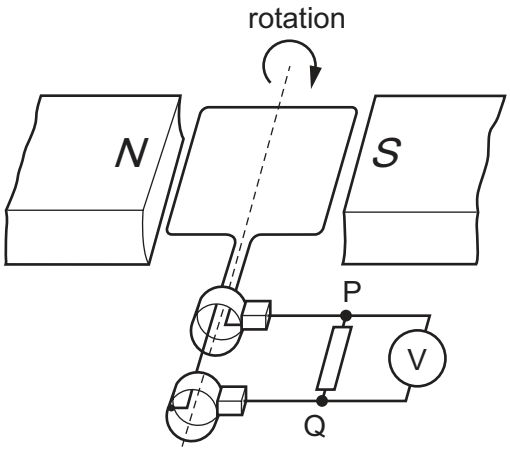
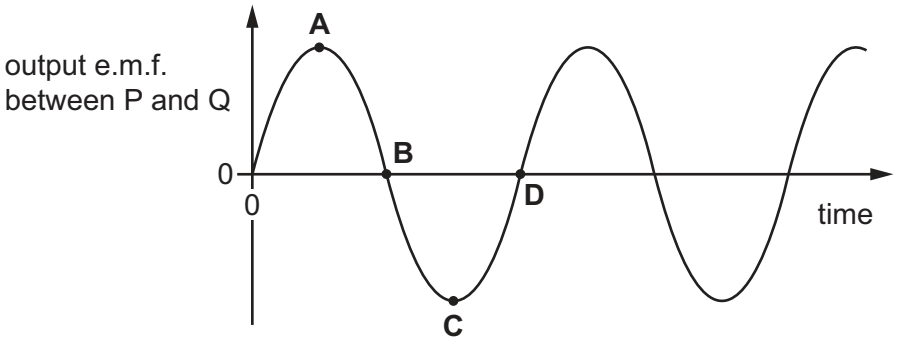


diagram 2



The graph shows the output e.m.f. between points P and Q plotted against time.

Which point shows the e.m.f. at time t_1?



32 What is the purpose of the split-ring commutator in an electric motor?

A to ensure that the magnetic field in the motor changes direction every half rotation

B to ensure that the magnetic field in the motor stays in the same direction at all times

C to ensure that the turning effect on the motor changes direction every half rotation

D to ensure that the turning effect on the motor stays in the same direction at all times

33 A beta particle has less mass than an alpha particle, but the speed of a beta particle emitted during radioactive decay is approximately 20 times greater than the speed of an alpha particle.

Which statement correctly compares properties of these two particles?

A Alpha particles are less penetrating because they have less kinetic energy than beta particles.

B Alpha particles are more penetrating because they have less kinetic energy than beta particles.

C Alpha particles are less ionising because they have more kinetic energy than beta particles.

D Alpha particles are more ionising because they have more kinetic energy than beta particles.

34 Which observation provides evidence for the nuclear atom?

A attraction of opposite charges

B emission of γ-rays during the decay of a radioactive nuclide

C scattering of α-particles by a thin metal foil

D scattering of γ-rays by a thin metal foil

35 Which effect on living things is **not** caused by ionising radiation?

A cancer

B cell death

C infection

D mutation

36 Isotope X is radioactive.

Which statement about X **must** be correct?

A A nucleus of X is unstable.

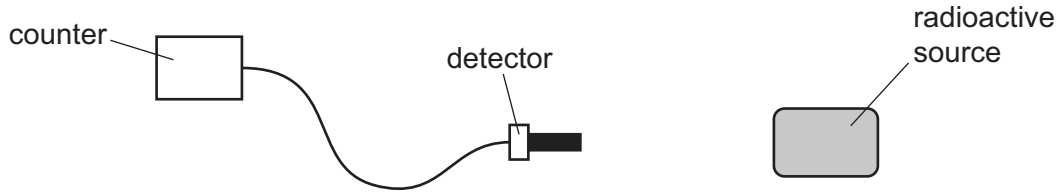
B X emits α-particles.

C X emits β-particles.

D X emits γ-radiation.

37 An experiment is done to measure the radiation from a radioactive source. The source has a half-life of 10 minutes.

The source is placed close to a detector that is connected to a counter, as shown.



The average background count rate is 20 counts / minute.

At the start of the experiment, the count rate recorded by the counter is 1000 counts / minute.

What is the count rate 10 minutes later?

A 490 counts / minute

B 500 counts / minute

C 510 counts / minute

D 530 counts / minute

38 In which direction does the Sun appear to move every day, when viewed from the Earth?

A east to west

B north to south

C south to north

D west to east

39 A distant galaxy is moving away from the Milky Way at 4 400 000 m / s.

What is the approximate distance between the Milky Way and this distant galaxy?

A 2×10^{12} m **B** 5×10^{11} m **C** 2×10^{24} m **D** 5×10^{23} m

40 The orbit of Mercury is closer to the Sun than the orbit of the Earth is to the Sun.

How do the values of the gravitational field strength of the Sun near Mercury and the orbital speed of Mercury compare to those values for the Earth?

	gravitational field strength of the Sun near Mercury	orbital speed of Mercury
A	greater	faster
B	greater	slower
C	smaller	faster
D	smaller	slower

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