Cambridge Assessment International Education

Cambridge IGCSE™

PHYSICS **0625/22**

Paper 2 Multiple Choice (Extended) **October/November 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 quantities are both vectors?

A acceleration and force

B acceleration and pressure

C density and force

D density and pressure

2 How is the deceleration of an object calculated from a speed–time graph?

A It is the area under the graph.

B It is the gradient of the graph.

C It is the difference between two readings on the horizontal (x) axis.

D It is the difference between two readings on the vertical (y) axis.

3 A space probe that has a mass of 600 kg is on the planet Mars.

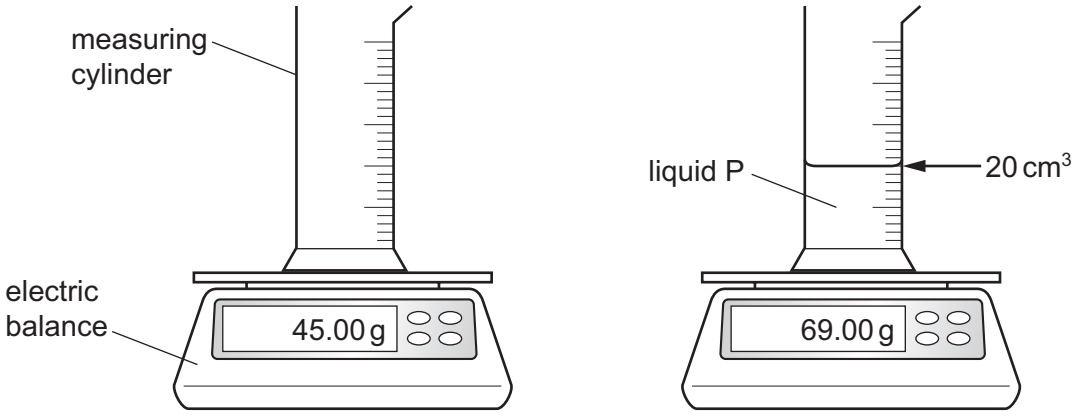
The acceleration of free fall on Mars is $4.0\,\text{m/s}^2$.

What is the weight of the space probe on Mars?

A 60 N **B** 150 N **C** 2400 N **D** 6000 N

4 Students are asked to predict the order in which three liquids, P, Q and R, will float on each other. They are told that the liquids will **not** mix.

The diagrams show how the density of liquid P is determined.



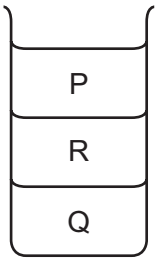
The table shows the densities of Q and R.

liquid	density / g/cm^3
Q	0.75
R	1.1

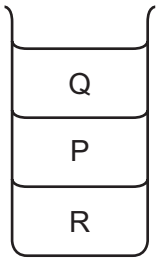
The liquids are poured gently into a tall beaker and allowed to settle.

Which diagram shows the liquids settled in the correct order?

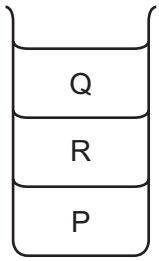
A



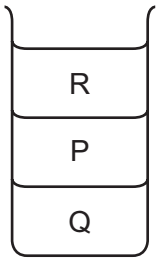
B



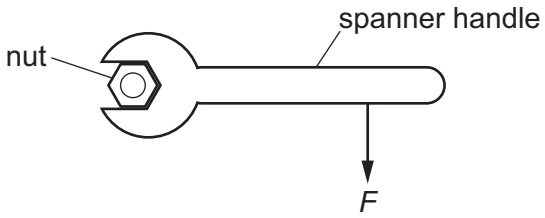
C



D



5 A force *F* is applied to a spanner, as shown.



Which action increases the moment of *F* about the centre of the nut?

A applying the force *F* to the right-hand end of the spanner handle

B applying the force *F* parallel to the spanner handle

C spraying oil on the nut

D using a shorter spanner

6 Diagram 1 shows a ball X of mass 0.15 kg travelling horizontally with a velocity of 2.1 m/s towards ball Y travelling at 0.4 m/s in the opposite direction.

Diagram 2 shows the velocities of the balls immediately after they collide.

diagram 1

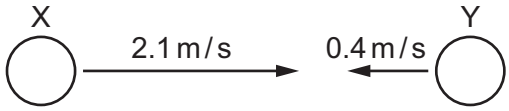
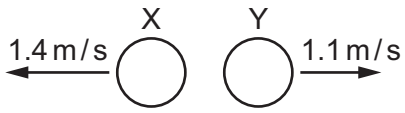


diagram 2



What is the mass of ball Y?

A 0.15 kg **B** 0.19 kg **C** 0.35 kg **D** 0.79 kg

7 A mass is suspended from a vertical spring. The mass is pulled downwards causing the spring to extend further. The mass is held in this position and then released.

Which energy changes occur during the initial movement of the mass when the mass is released?

	gravitational potential energy store	kinetic energy store	elastic potential energy store
A	decreases	decreases	increases
B	decreases	increases	increases
C	increases	decreases	decreases
D	increases	increases	decreases

8 Which energy resource stores kinetic energy?

A coal

B nuclear fission

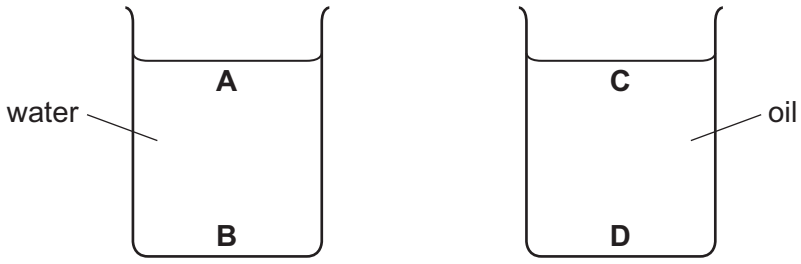
C solar

D wind

9 Two beakers are filled to the same depth, one with water and one with oil.

The density of water is 1000 kg / m^3. The density of oil is 920 kg / m^3.

In which position is the pressure the greatest?



10 The pressure of the air in a car tyre rises after a long journey. This is caused by a change in the average speed of the air particles and a change in the temperature of the air in the tyre.

Which row describes the changes that have caused the air pressure in the tyre to rise?

	average speed of the air particles	temperature of the air
A	decreases	decreases
B	decreases	increases
C	increases	decreases
D	increases	increases

11 In which range of temperatures is water a liquid?

A 0 K to 100 K

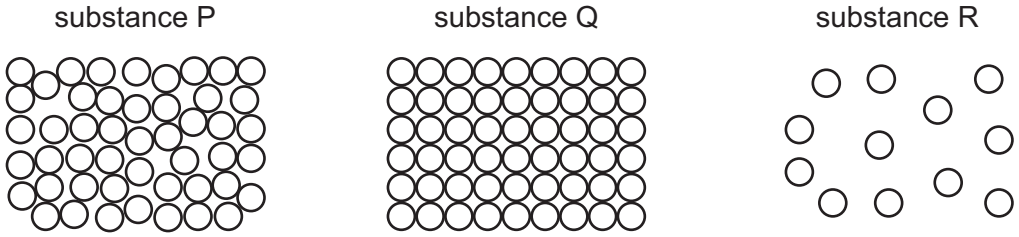
B 0 K to 273 K

C 100 K to 373 K

D 273 K to 373 K

[Turn over

12 The diagram represents the particle arrangements in samples of three different substances, P, Q and R.



The samples have equal volumes and the same temperature.

The samples are heated. The temperature increase of each sample is the same and **no** changes of state take place.

Which row shows possible percentage increases in volume for the three samples?

	sample of substance P / %	sample of substance Q / %	sample of substance R / %
A	0.066	1.9	7.2
B	0.066	7.2	1.9
C	1.9	0.066	7.2
D	1.9	7.2	0.066

13 A cup contains 0.25 kg of water at 60 °C. Some time later, the water has cooled to 20 °C.

How much energy has been transferred from the water to the surroundings?

(The specific heat capacity of water is 4200 J / (kg °C).)

A 21 000 J **B** 42 000 J **C** 63 000 J **D** 84 000 J

14 A pure substance is heated slowly. The temperature of the substance is measured as it starts to melt and when it finishes melting.

Which statement is correct?

A The temperature decreases slightly as the substance melts.

B The temperature fluctuates as the substance melts.

C The temperature increases as the substance melts.

D The temperature stays the same as the substance melts.

15 A lamp has a metal filament that glows when heated by an electric current.

The middle of the filament has a very high temperature. The ends of the filament are connected to the base of the lamp and are cooler.

Which statement is correct?

A Some thermal energy is conducted to the base of the lamp.

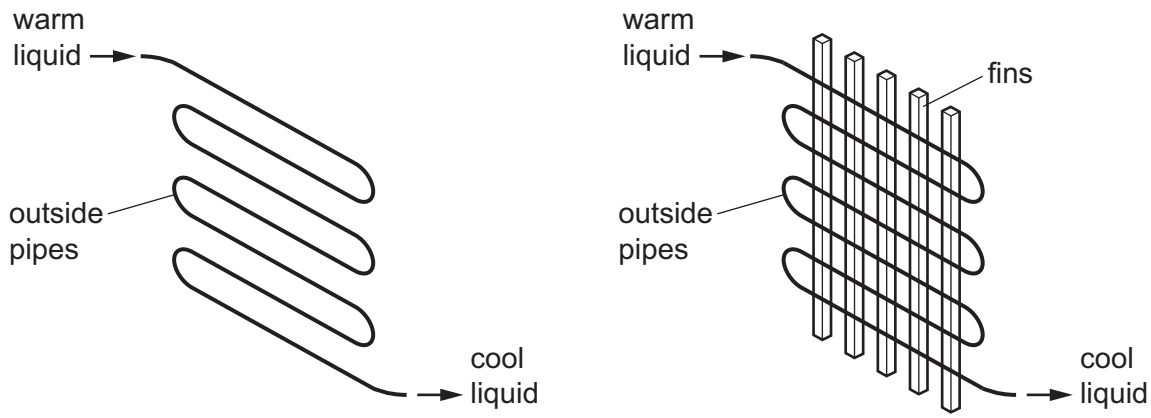
B The filament radiates energy equally at all points along its length.

C The lamp transfers all of the input energy as visible light.

D When the potential difference (p.d.) across the filament is halved, the power output is halved.

16 A liquid passes through pipes inside a refrigerator. The liquid warms as the inside of the refrigerator cools. The warm liquid is then passed through pipes on the outside of the refrigerator to cool it before it goes back through the refrigerator.

The diagrams show two designs for the outside cooling pipes. One design has copper rods, called fins, attached to the pipes.



The outside pipes and fins can be painted silver or black.

Which design of outside pipes will cool the liquid most quickly?

A painted black with fins

B painted black without fins

C painted silver with fins

D painted silver without fins

17 An earthquake-monitoring station records the arrival of 16 complete wavelengths of an earthquake wave in a time of 20 s.

The speed of the earthquake wave is 6.0 km / s.

What is the wavelength of the earthquake wave?

A 1.3×10^{-4} m **B** 2.1×10^{-4} m **C** 4.8×10^{3} m **D** 7.5×10^{3} m

18 Which statement is correct?

A Seismic S-waves are longitudinal.

B Sound waves are longitudinal.

C The amplitude is always greater than the wavelength in a longitudinal wave.

D The vibration is at right-angles to the direction of propagation in a longitudinal wave.

19 A water droplet is falling towards a horizontal plane mirror.

At one moment, the droplet is a distance of 1.5 m above the mirror and falling at a speed of 2.0 m / s.

What is the distance between the droplet and its image and what is the speed of the image at this moment?

	distance between water droplet and its image / m	$\frac{\text{speed of image}}{\text{m/s}}$
A	1.5	2.0
B	1.5	4.0
C	3.0	2.0
D	3.0	4.0

20 Total internal reflection may occur when light reaches an air–glass boundary.

Under which conditions is light totally internally reflected?

	medium in which light travels towards the boundary	angle of incidence
A	air	greater than the critical angle
B	air	less than the critical angle
C	glass	greater than the critical angle
D	glass	less than the critical angle

21 A long-sighted person **cannot** see objects clearly that are a short distance away because the image is blurred.

Where is the image formed relative to the retina and which type of lens is used to correct long-sightedness?

	position of image	lens used for correction
A	behind retina	converging
B	behind retina	diverging
C	in front of retina	converging
D	in front of retina	diverging

22 What is the speed of infrared radiation in glass with a refractive index of 1.5?

A $340\,\text{m/s}$

B $2.0 \times 10^8\,\text{m/s}$

C $3.0 \times 10^8\,\text{m/s}$

D $4.5 \times 10^8\,\text{m/s}$

23 Sound travels through air as a series of compressions and rarefactions.

Which statement correctly compares a compression with a rarefaction?

A In a compression, the wavelength is longer than in a rarefaction.

B In a compression, the wavelength is shorter than in a rarefaction.

C In a compression, the density of the air is greater than in a rarefaction.

D In a compression, the density of the air is lower than in a rarefaction.

24 Which statements about magnets are correct?

1 Permanent magnets are made of steel.

2 Electromagnets are temporary magnets.

3 A magnet can be used to induce magnetism in an iron bar.

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

25 In a circuit, two identical lamps are in parallel. The parallel pair of lamps is in series with a resistor and a battery.

The battery does 120 J of work moving 50 C of charge around the circuit in time *t*.

In each lamp, 40 J of work is done by the charge that passes through it in time *t*.

The electromotive force (e.m.f.) of the battery is *E* and the potential difference (p.d.) across one lamp is *V*.

Which statement about *E* and *V* is correct?

A *E* is 2.4 V and *V* is 0.80 V.

B *E* is 2.4 V and *V* is 1.6 V.

C *E* is 4.8 V and *V* is 2.4 V.

D *E* is 4.8 V and *V* is 4.8 V.

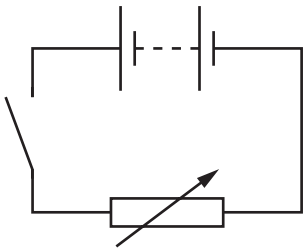
26 Two wires, X and Y, are made from the same metal and have the same resistance.

Which row identifies a possible pair of values for X and for Y?

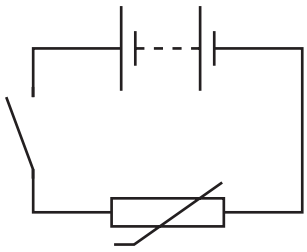
	length of X / cm	diameter of X / mm	length of Y / cm	diameter of Y / mm
A	50	0.40	200	0.10
B	50	0.40	200	0.20
C	50	0.40	200	0.80
D	50	0.40	200	1.60

27 Which circuit contains a light-dependent resistor (LDR)?

A



B



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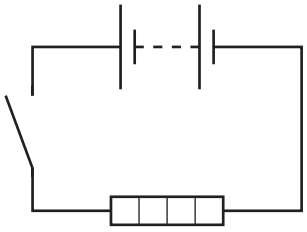

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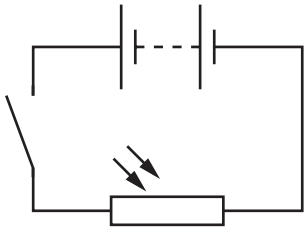
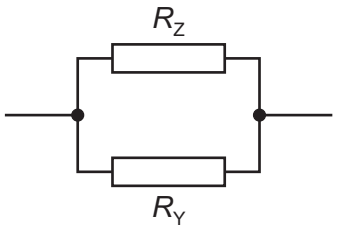


28 A teacher asks three students to write down an equation to determine the combined resistance R_C of resistors with resistances R_Y and R_Z.



Which students are correct?

student 1 $\frac{1}{R_C} = \frac{1}{R_Y} + \frac{1}{R_Z}$

student 2 $\frac{1}{R_C} = \frac{1}{R_Y + R_Z}$

student 3 $R_C = \frac{1}{R_Y} + \frac{1}{R_Z}$

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

29 An electrical appliance has a symbol on it to indicate it is double-insulated.

Which statement is correct?

A A two-core, flexible cable with **no** earth wire is used to connect it to the mains supply.

B It needs an earth wire that is connected to a fuse.

C **No** fuse or circuit breaker is needed.

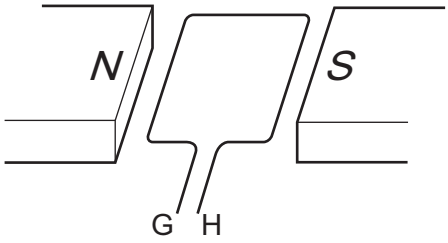
D The cable should be connected to the live and earth connectors of the plug but **not** the neutral.

30 A length of wire moves across the space between the poles of a magnet. A voltmeter measures the electromotive force (e.m.f.) generated between the two ends of the wire.

What gives the highest reading on the voltmeter?

	speed of wire	strength of magnet
A	fast	weak
B	fast	strong
C	slow	weak
D	slow	strong

31 The diagram shows a simple a.c. generator.



What is connected to G and H so that alternating current can be provided to an external circuit?

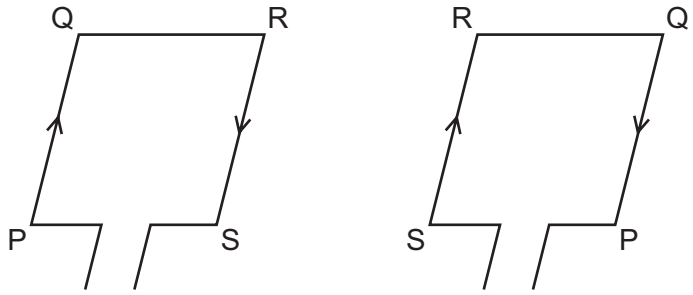
A cell

B commutator

C slip rings

D soft iron core

32 The diagrams show the coil in a d.c. electric motor in two positions. As the coil rotates through 180°, the direction of the current in the coil reverses from PQRS to SRQP.



Which part of the motor is responsible for reversing the current?

A the brushes

B the coil

C the magnets

D the split-ring commutator

33 The arrow shows the path of an α-particle travelling towards the centre of a gold nucleus.

Which description of the path of the α-particle after striking the gold nucleus is correct?

A The α-particle is deflected through a very small angle towards the top of the page.

B The α-particle is deflected back along its initial path.

C The α-particle carries on in a straight line with **no** deflection.

D The α-particle is captured by the nucleus and goes into orbit around it.

34 A teacher writes the nuclide equation for a fusion reaction.

$$^{2}_{1}H + {}^{X}_{1}H \rightarrow {}^{4}_{2}Q + {}^{1}_{0}n$$

What is the missing number X and the missing element Q?

	X	Q
A	2	H
B	2	He
C	3	H
D	3	He

35 Radon gas is a source of radiation that contributes to background radiation.

What does **not** contribute to background radiation?

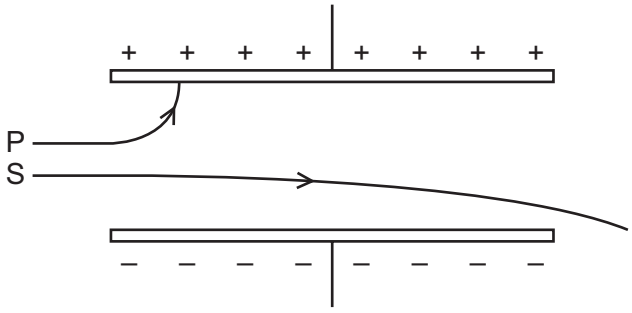
A electromagnetic rays

B food and drink

C rocks

D seismic waves

36 Two beams of radiation, P and S, enter an electric field, as shown.



Which types of radiation are P and S?

	P	S
A	beta (β)	alpha (α)
B	beta (β)	gamma (γ)
C	gamma (γ)	alpha (α)
D	gamma (γ)	gamma (γ)

[Turn over

37 Which change takes place in the nucleus when it decays by beta (β) emission?

A neutron + electron $\rightarrow$ proton

B neutron $\rightarrow$ proton + electron

C proton + electron $\rightarrow$ neutron

D proton $\rightarrow$ neutron + electron

38 A space probe measures the gravitational field strength at four different distances from a planet.

The point furthest from the planet is measured first and the point nearest the planet is measured last.

In which order were the measurements taken?

A 6.3 N / kg, 10 N / kg, 14 N / kg, 20 N / kg

B 10 N / kg, 14 N / kg, 6.3 N / kg, 20 N / kg

C 20 N / kg, 14 N / kg, 6.3 N / kg, 10 N / kg

D 20 N / kg, 14 N / kg, 10 N / kg, 6.3 N / kg

39 The galaxy Draco II is a distance of 6.6×10^{20} m from Earth.

What is this distance in light-years?

A 1.4×10^{4} light-years

B 6.9×10^{4} light-years

C 1.4×10^{6} light-years

D 6.9×10^{6} light-years

40 What is a possible result of a supernova explosion?

A a neutron star

B a red giant star

C a red supergiant star

D a white dwarf star

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