Cambridge Assessment International Education
Cambridge International General Certificate of Secondary Education

PHYSICS **0625/23**

Paper 2 Multiple Choice (Extended) **October/November 2019**

45 minutes

Additional Materials: Multiple Choice Answer Sheet
Soft clean eraser
Soft pencil (type B or HB recommended)

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READ THESE INSTRUCTIONS FIRST

Write in soft pencil.
Do not use staples, paper clips, glue or correction fluid.
Write your name, centre number and candidate number on the Answer Sheet in the spaces provided unless this has been done for you.
DO **NOT** WRITE IN ANY BARCODES.

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 separate Answer Sheet.

Read the instructions on the Answer Sheet very carefully.

Each correct answer will score one mark. A mark will not be deducted for a wrong answer.
Any rough working should be done in this booklet.
Electronic calculators may be used.
Take the weight of 1.0 kg to be 10 N (acceleration of free fall = 10 m / s^2).

This syllabus is regulated for use in England, Wales and Northern Ireland as a Cambridge International Level 1/Level 2 Certificate.

This document consists of **14** printed pages and **2** blank pages.

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1 Which is the best apparatus to use to measure the thickness of a coin?

A balance

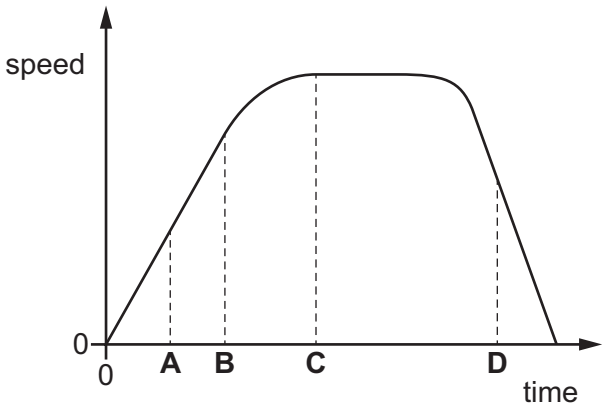
B ruler with a millimetre scale

C micrometer screw gauge

D pressure gauge

2 The graph shows how the speed of an object varies with time.

At which labelled time is the object decelerating?



3 A car travels at an average speed of 60 km / h for 15 minutes.

How far does the car travel in 15 minutes?

A 4.0 km **B** 15 km **C** 240 km **D** 900 km

4 Which equation shows the relationship between the weight W and the mass m of an object?

A $W = \frac{m}{g}$

B $W = mg$

C $W = m + g$

D $W = \frac{g}{m}$

5 A box of mass 2.0 kg is pulled across a horizontal floor by a force of 6.0 N.

The frictional force acting on the box is 1.0 N.

What is the acceleration of the box?

A $0.40\,m/s^2$ **B** $2.5\,m/s^2$ **C** $3.0\,m/s^2$ **D** $3.5\,m/s^2$

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6 Four hollow glass spheres P, Q, R and S each have a mass of 72 g.

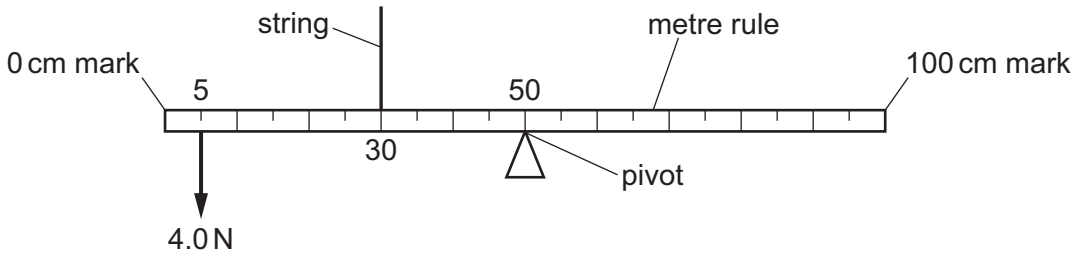
Their volumes are given in the table.

	volume / cm^3
P	55
Q	65
R	75
S	85

Which spheres sink in a liquid of density 0.9 g / cm^3?

A P, Q and R **B** Q, R and S **C** R and S only **D** S only

7 The diagram shows a uniform metre rule. The rule is pivoted at its mid-point. A downward force of 4.0 N acts on the rule at the 5 cm mark. The rule is held by a string at the 30 cm mark. The rule is in equilibrium.



What is the upward force that the string exerts on the rule?

A 0.67 N **B** 4.0 N **C** 6.0 N **D** 9.0 N

8 A ship sails due North at a speed of 20 m / s. A current in the water begins to move from East to West. The speed of this current is 20 m / s.

What is the magnitude of the resultant velocity of the ship?

A 0 m / s **B** 20 m / s **C** 28 m / s **D** 40 m / s

9 The momentum of a body is changed by a force acting on it for a period of time.

Which action increases the change in momentum?

A doubling the force and halving the time

B doubling the force for the same time

C halving both the force and time

D halving the force and doubling the time

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10 A toy train P of mass 0.50 kg is travelling along a straight track with a velocity of 3.0 m / s. It collides with a stationary train Q of mass 1.0 kg. The two trains then stick together.

What is the velocity of the combined trains?

A 1.0 m / s in the same direction as P was travelling originally

B 1.0 m / s in the reverse direction to that in which P was travelling originally

C 1.5 m / s in the same direction as P was travelling originally

D 1.5 m / s in the reverse direction to that in which P was travelling originally

11 Brakes are used to slow down a moving car.

Into which form of energy is most of the kinetic energy converted as the car slows down?

A chemical

B elastic

C thermal

D sound

12 A force of 25 N acts on an object. The work done by the force is 400 J.

How far does the object move in the direction of the force?

A 6.3 cm **B** 16 cm **C** 16 m **D** 10 km

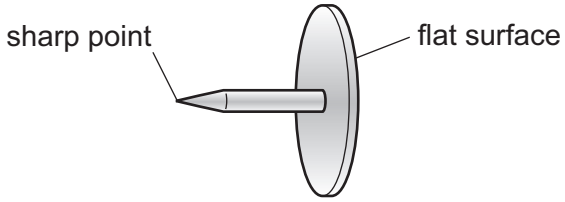
13 A car is moving along a straight horizontal road. The car has 1.6 MJ of kinetic energy. The car accelerates for 20 s until the kinetic energy of the car increases to 2.5 MJ.

What is the minimum average power developed by the car engine for this acceleration?

A 45 W **B** 205 W **C** 45 kW **D** 205 kW

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14 A drawing pin (thumb tack) has a sharp point at one end and a flat surface at the other end.



The pin is pushed into a wooden board.

How do the pressure and the force at the sharp point compare with the pressure and the force on the flat surface?

	force at the sharp point	pressure at the sharp point
A	greater than on the flat surface	greater than on the flat surface
B	greater than on the flat surface	less than on the flat surface
C	the same as on the flat surface	greater than on the flat surface
D	the same as on the flat surface	less than on the flat surface

15 Which row compares the separation and the motion of the molecules of a hot gas with those of a cool liquid? (Both the gas and the liquid are at the same pressure.)

	separation	motion
A	greater for a gas	faster for a gas
B	greater for a gas	slower for a gas
C	smaller for a gas	faster for a gas
D	smaller for a gas	slower for a gas

16 A fixed mass of gas has a volume of 25 cm^3. The pressure of the gas is 100 kPa.

The volume of the gas is slowly decreased by 15 cm^3 at constant temperature.

What is the change in pressure of the gas?

A 67 kPa **B** 150 kPa **C** 170 kPa **D** 250 kPa

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17 A liquid turns into a gas. This occurs only at one particular temperature, and the change happens throughout the liquid.

What is this process called?

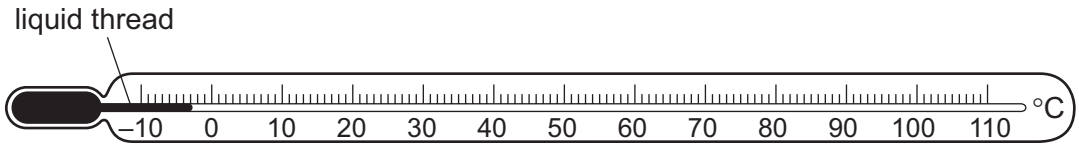
A boiling

B condensation

C evaporation

D fusion

18 The diagram shows a liquid-in-glass thermometer.



When the temperature of the thermometer rises, the changes produced cause the liquid thread to move to the right.

Why does this happen when the temperature of the thermometer rises?

A Gases contract and liquids expand.

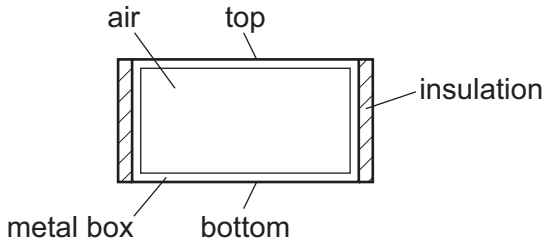
B Gases contract and solids expand.

C Liquids expand more than gases.

D Liquids expand more than solids.

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19 A sealed metal box contains a fixed mass of air. The sides of the box are insulated.



A scientist investigates the thermal conductivity of air. She measures how quickly thermal energy passes between the top and bottom of the box.

Which row gives the correct procedure and conclusion?

	procedure	conclusion
A	heat bottom surface	air is a good thermal conductor
B	heat bottom surface	air is a poor thermal conductor
C	heat top surface	air is a good thermal conductor
D	heat top surface	air is a poor thermal conductor

20 In a cold country, the ground is covered in snow. There is a pile of black sand outdoors and its temperature is the same as that of the snow. A man sprinkles a thin layer of this sand over the snow.

Why does the black sand help to melt the snow during the day?

A Any thermal energy still left in the sand will melt the snow.

B The black sand is a good absorber of the infrared radiation from the Sun.

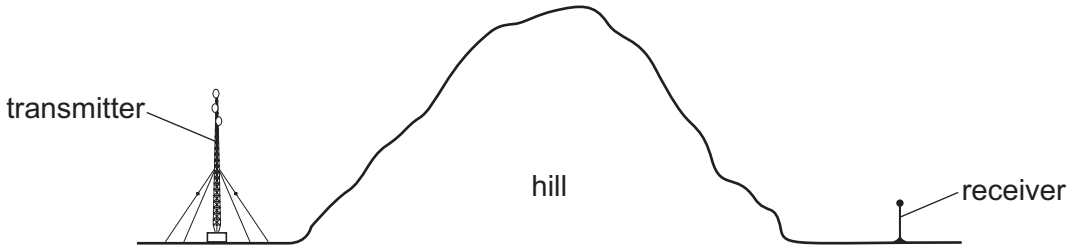
C The black sand is a good conductor of thermal energy.

D The black sand lowers the melting point of the snow.

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[Turn over

21 A large hill blocks the direct path between a transmitter of radio waves and a receiver, as shown.



The receiver picks up the signal from the transmitter even though the radio waves do not travel through the hill.

Which row is correct?

	A possible way for this to happen is	A stronger signal is received using
A	diffraction round the hill.	longer wavelengths.
B	diffraction round the hill.	shorter wavelengths.
C	refraction round the hill.	longer wavelengths.
D	refraction round the hill.	shorter wavelengths.

22 A person stands 1.0 m in front of a plane mirror. The mirror is moved away from the person at a speed of 1.0 m / s.

Which statement is correct?

A The image moves away from the person at a speed of 1.0 m / s.

B The image moves away from the person at a speed of 2.0 m / s.

C The image moves towards the person at a speed of 1.0 m / s.

D The image moves towards the person at a speed of 2.0 m / s.

23 White light is refracted and dispersed when it enters a glass prism from air.

Which colour has the lowest speed as it moves through the glass prism?

A blue light

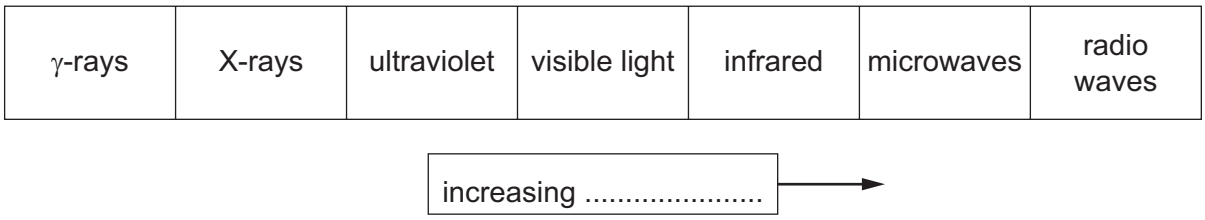
B orange light

C red light

D violet light

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24 The diagram shows the electromagnetic spectrum.



A word is missing from the label below the spectrum.

Which word is missing?

A amplitude

B frequency

C speed

D wavelength

25 Which row gives a possible set of values for the speed of sound in ice, in water and in steam?

	speed of sound in ice / m/s	speed of sound in water / m/s	speed of sound in steam / m/s
A	500	1500	4000
B	1500	4000	500
C	4000	500	1500
D	4000	1500	500

26 A steel bar is placed in an East-West direction for it to be demagnetised. No other magnet is nearby.

Which method is **not** suitable?

A Hammering the bar.

B Heating the bar to a very high temperature.

C Slowly taking the bar out of a coil that carries an alternating current.

D Slowly taking the bar out of a coil that carries a direct current.

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27 A plastic rod is rubbed with a dry cloth. The rod becomes positively charged.

Why has the rod become positively charged?

A It has gained electrons.

B It has gained neutrons.

C It has lost electrons.

D It has lost neutrons.

28 There is a current of 3.0 A in a resistor for time *t*. During time *t*, a charge of 120 C flows through the resistor.

What is time *t*?

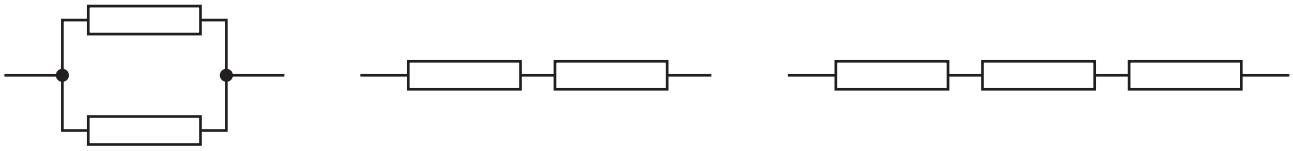
A 0.025 minutes

B 0.025 s

C 40 minutes

D 40 s

29 Identical resistors are connected together to form arrangements X, Y and Z.



X Y Z

What is the correct order of the resistances of the arrangements from the largest to the smallest?

A $X \rightarrow Y \rightarrow Z$

B $Y \rightarrow X \rightarrow Z$

C $Z \rightarrow X \rightarrow Y$

D $Z \rightarrow Y \rightarrow X$

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30 Resistors of resistance 1.0 Ω, 2.0 Ω and 3.0 Ω are connected in parallel across the terminals of a cell.

Which statement is correct?

A The currents in the resistors are equal.

B The sum of the currents in the three resistors is equal to the current in the cell.

C The sum of the potential differences (p.d.'s) across the resistors is equal to the electromotive force (e.m.f.) of the cell.

D The potential difference across the 3.0 Ω resistor is greater than the potential difference across the other two resistors.

31 Diagram 1 shows a circuit containing an a.c. power supply, an unknown component X and a fixed resistor.

The graph in diagram 2 shows how the potential difference (p.d.) across the resistor varies with time.

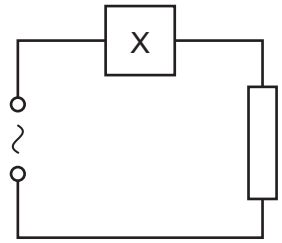


diagram 1

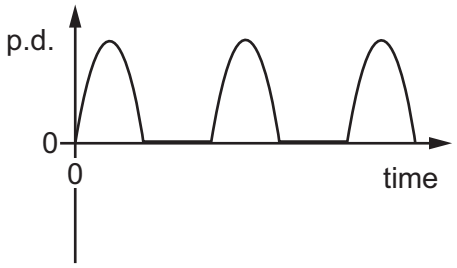


diagram 2

What is component X?

A thermistor

B relay coil

C diode

D light-dependent resistor

32 An AND gate has two inputs and one output.

Which truth table represents the action of the AND gate?

A

input 1	input 2	output
0	0	0
0	1	1
1	0	1
1	1	1

B

input 1	input 2	output
0	0	0
0	1	0
1	0	0
1	1	1

C

input 1	input 2	output
0	0	1
0	1	1
1	0	1
1	1	0

D

input 1	input 2	output
0	0	1
0	1	0
1	0	0
1	1	0

33 Where must a fuse be connected in a mains electric circuit?

A the earth wire only

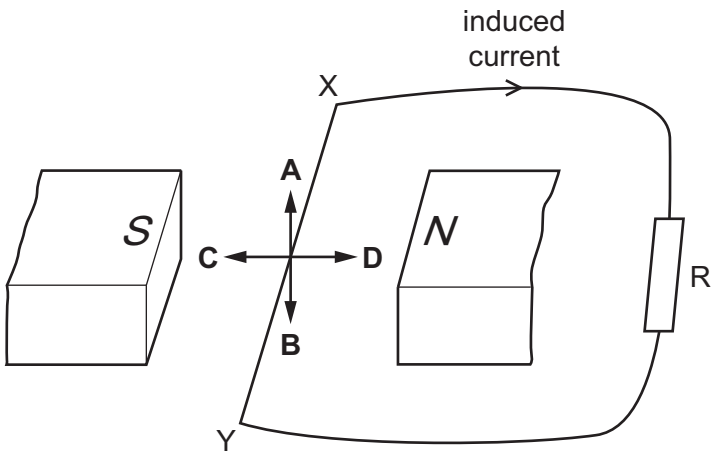
B the live wire only

C the neutral wire only

D the live wire and the earth wire

34 A wire XY is connected to a resistor R. The wire is moved in the magnetic field between two magnetic poles.

In which direction must the wire be moved so that the induced current is in the direction shown?



35 A step-up transformer produces a 60 V a.c. output from a 12 V a.c. input.

There are 50 turns on the secondary coil.

How many turns are there on the primary coil?

A 5 **B** 10 **C** 50 **D** 250

36 An a.c. generator contains a coil that rotates at a rate of 4500 revolutions per minute.

What is the frequency of the alternating current?

A 1.25 Hz **B** 75 Hz **C** 150 Hz **D** 4500 Hz

37 Why are some radioactive sources stored in boxes made from lead?

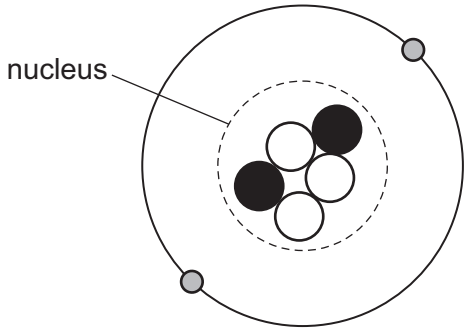
A Lead absorbs emissions from the radioactive sources.

B Lead decreases the half-life of radioactive sources.

C Lead increases the half-life of radioactive sources.

D Lead repels emissions from the radioactive sources.

38 The diagram represents a neutral atom.



Which row identifies each type of particle in the diagram?

			
A	electron	neutron	proton
B	electron	proton	neutron
C	neutron	electron	proton
D	proton	electron	neutron

39 A thin metal foil is placed in a vacuum. α-particles are fired at the foil and most go straight through. A very small proportion of the α-particles are deflected through large angles.

What does this provide evidence for?

A α-particles are very small.

B There are negative electrons in each atom.

C There is a tiny nucleus in each atom.

D There are neutrons in each atom.

40 The background count rate measured by a radiation counter is 40 counts per minute.

With the counter close to a radioactive source, the counter reading is 960 counts per minute.

The half-life of the source is 20 minutes.

What is the counter reading one hour later?

A 115 counts per minute

B 120 counts per minute

C 155 counts per minute

D 160 counts per minute

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