Cambridge Assessment International Education

Cambridge IGCSE™

PHYSICS **0625/13**

Paper 1 Multiple Choice (Core) **May/June 2023**

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.

[Turn over

1 Which piece of apparatus is used to measure the length of a copper rod of length approximately 2 cm?

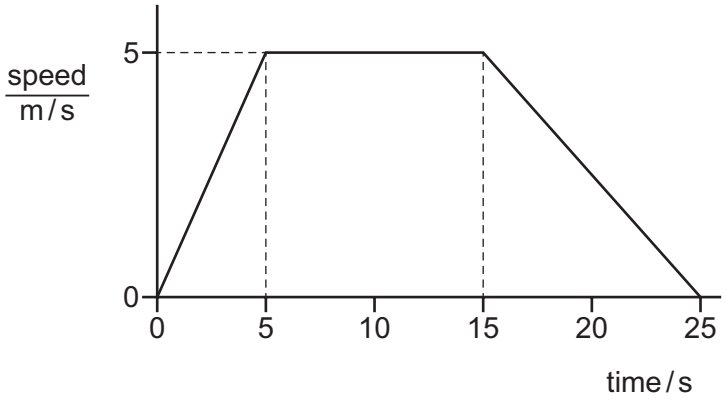
A digital timer

B measuring cylinder

C ruler

D balance

2 The speed–time graph shows the motion of an object.



How far does the object travel at constant speed?

A 25 m **B** 50 m **C** 75 m **D** 125 m

3 A rock falls off a cliff onto a beach. The effect of air resistance on the rock is negligible.

Which row describes the acceleration and speed of the rock as it falls?

	acceleration	speed
A	constant	constant
B	constant	increasing
C	increasing	constant
D	increasing	increasing

4 Two rectangular blocks consist of different materials.

Four different methods are suggested to compare the two masses.

1 Compare the accelerations with which they fall freely.

2 Compare the values of their lengths × breadths × heights.

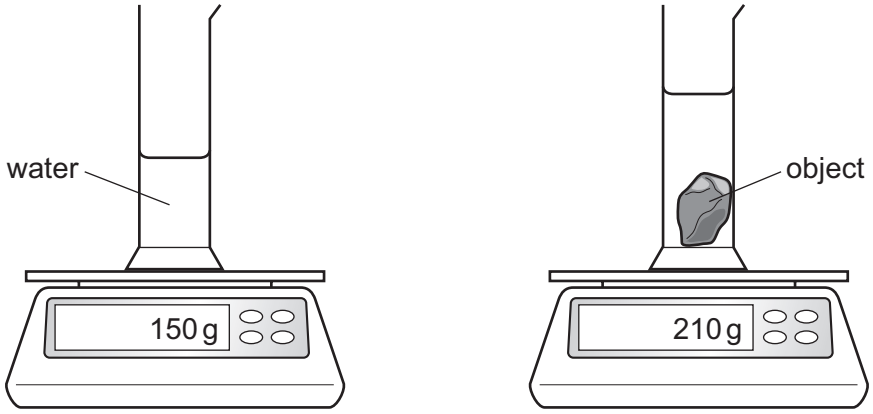
3 Hang each in turn from the same spring. Compare the extensions.

4 Place one in the right-hand pan of a beam balance and the other in the left-hand pan.

Which methods give a comparison of the two masses?

A 1, 2 and 3 **B** 1 and 2 only **C** 3 and 4 only **D** 4 only

5 A measuring cylinder containing 50 cm^3 of water is put on a balance.



A solid object is put in the cylinder and the water level rises to 75 cm^3.

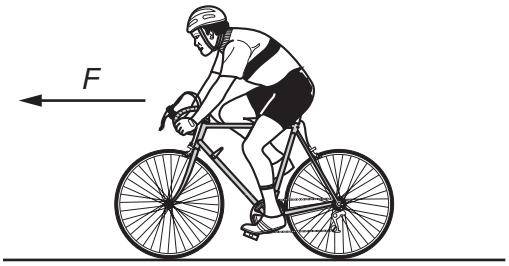
What is the density of the object?

A 0.80 g / cm^3 **B** 2.4 g / cm^3 **C** 2.8 g / cm^3 **D** 8.4 g / cm^3

[Turn over

6 A cyclist is travelling in a straight line along a horizontal road at a constant speed.

A constant driving force *F* acts on the cyclist in the forward direction shown.



Which statement about the magnitude of the frictional forces acting on the cyclist is correct?

A The magnitude is equal to *F*.

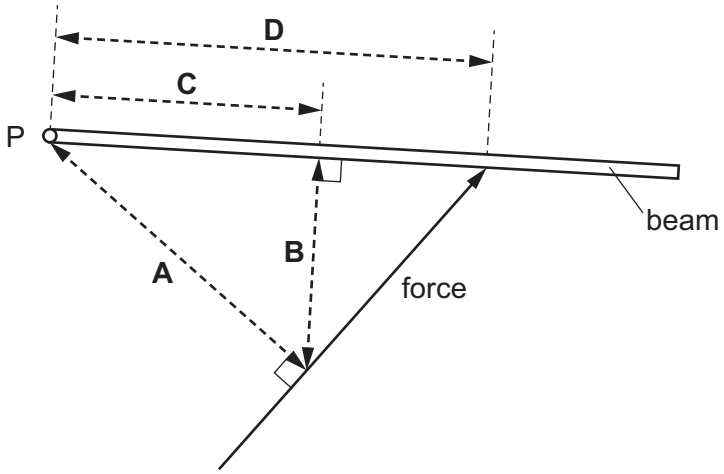
B The magnitude is smaller than *F*, but greater than zero.

C The magnitude is greater than *F*.

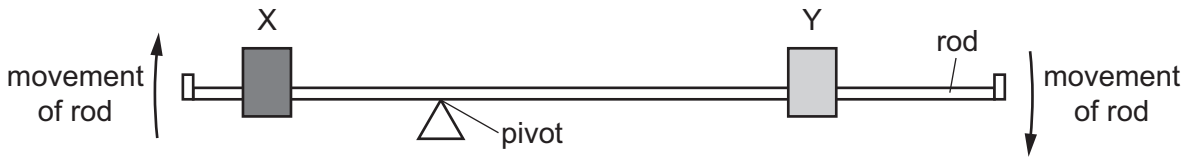
D The magnitude is zero.

7 A beam is pivoted at P. A force is applied to the beam.

Which distance is multiplied by the force to give the moment of the force about P?



8 The diagram shows an unbalanced rod. Two loads X and Y can be moved along the rod.



The rod turns in a clockwise direction, as shown.

Which action could make the rod balance?

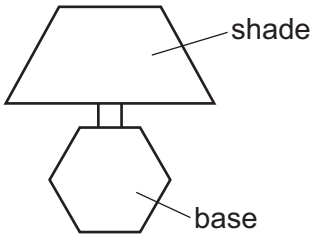
A moving X to the left

B moving X to the right

C moving Y to the right

D moving the pivot to the left

9 It is important that an electric table lamp with a lamp shade does not get knocked over easily.



Which statement is correct?

A The centre of mass must be as low as possible.

B The lamp must have a shade which is heavier than the base.

C The lamp must have a narrow base.

D The lamp shade must be wide.

10 A bicycle braking system transfers energy from a kinetic energy store to an internal energy store.

A motor converts energy from a chemical energy store (battery) to a kinetic energy store.

What enables these energy transfers?

	braking system	motor
A	electrical work	mechanical work
B	electrical work	electrical work
C	mechanical work	mechanical work
D	mechanical work	electrical work

[Turn over

11 A toy car is pushed a distance of 2.4 m with a force equal to 460 N.

How much energy is transferred?

A 190 J **B** 190 W **C** 1100 J **D** 1100 W

12 The engine of a motor vehicle develops a large power.

Which statement is correct?

A The driving force acting on the vehicle must be large.

B The engine must have a very large volume.

C The engine must transfer large amounts of energy each second.

D The vehicle must be very fast.

13 A solid cube has sides 0.50 m long and a mass of 120 kg. It stands on the ground on one face.

Which pressure does the cube exert on the ground?

A 480 kg / m^3 **B** 960 kg / m^3 **C** 4700 N / m^2 **D** 9400 N / m^2

14 What is the lowest possible temperature (absolute zero) and what happens to the energy of particles at this temperature?

	lowest possible temperature / °C	particle energy
A	–273	particles have least kinetic energy
B	–273	particles have zero gravitational potential energy
C	0	particles have least kinetic energy
D	0	particles have zero gravitational potential energy

15 Which statement about the particles of a substance after condensation is correct?

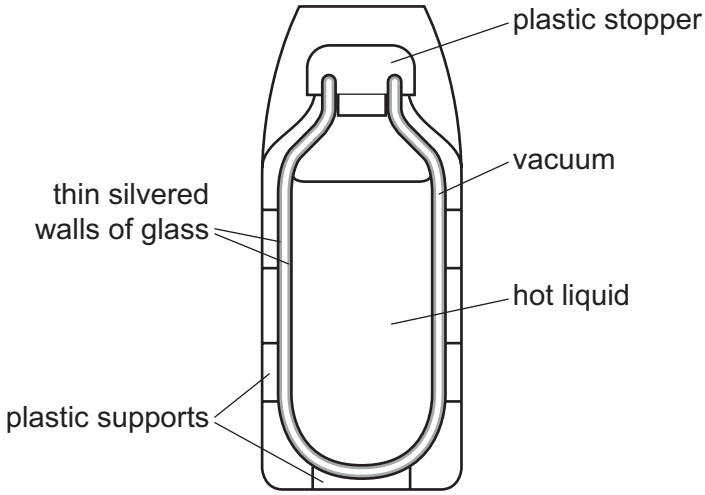
A They are close to each other and slide over each other.

B They are close to each other and vibrate about fixed points.

C They are far apart from each other and vibrate about fixed points.

D They are far apart from each other and move freely within the container.

16 The diagram shows a flask designed to reduce the loss of thermal energy from a hot liquid.



Which methods of thermal energy transfer are the silvered walls designed to reduce?

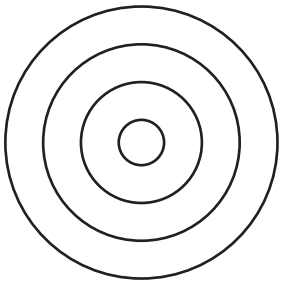
A conduction, convection and radiation

B conduction and convection only

C conduction only

D radiation only

17 A drop of water from a tap falls onto the surface of some water of constant depth.



view from above

Water waves spread out on the surface of the water.

Which statement is correct?

A The waves are longitudinal and travel at the same speed in all directions.

B The waves are longitudinal and travel more quickly in one direction than in others.

C The waves are transverse and travel at the same speed in all directions.

D The waves are transverse and travel more quickly in one direction than in others.

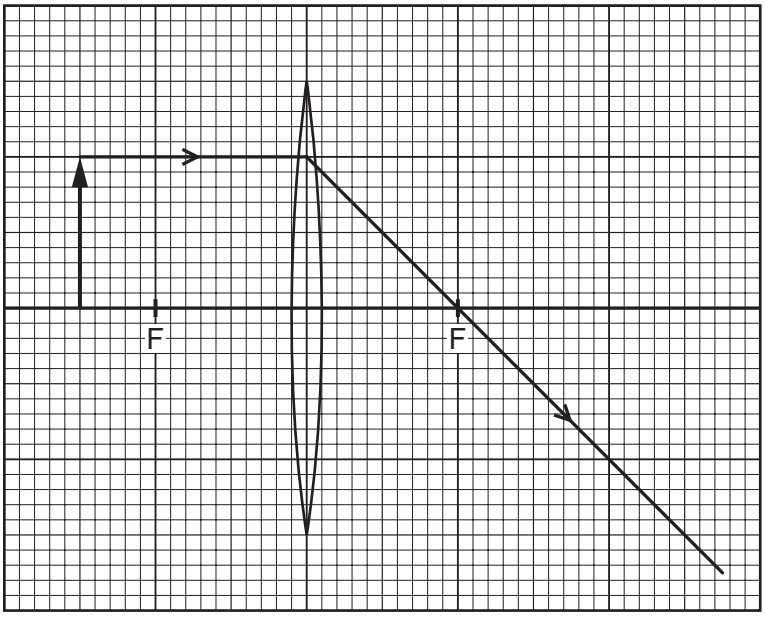
[Turn over

18 The optical image formed by a plane mirror is the same size as the object.

Which row describes the other characteristics of the optical image formed?

	distance from the mirror	real or virtual
A	same as object	virtual
B	smaller than object	virtual
C	larger than object	real
D	same as object	real

19 The diagram shows a partly completed scale drawing of an upright object placed 3 cm in front of a thin converging lens of focal length 2 cm.



What is the nature of the image formed by this lens?

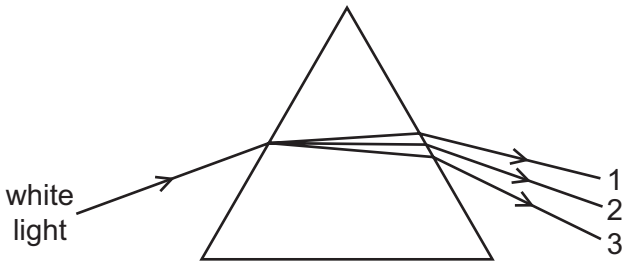
A diminished, inverted and closer to the lens than the object

B diminished, upright and further from the lens than the object

C enlarged, inverted and closer to the lens than the object

D enlarged, inverted and further from the lens than the object

20 A narrow beam of white light passes through a prism and is dispersed into a spectrum.



Which row is correct?

	colour 1	colour 2	colour 3
A	blue	yellow	red
B	red	blue	yellow
C	red	yellow	blue
D	yellow	blue	red

21 Which row matches a region of the electromagnetic spectrum to one of its uses?

	region	use
A	gamma rays	intruder alarms
B	infrared	satellite television
C	microwaves	mobile (cell) phones
D	radio waves	sterilising food

22 A ship sounds its horn when it is 790 m from a cliff. A passenger on the ship hears the echo 4.8 s later.

What is the speed of the sound?

A 165 m / s **B** 330 m / s **C** 340 m / s **D** 1896 m / s

23 Which row gives the metal used to make the core of an electromagnet and one property of the electromagnet?

	metal	property
A	iron	permanent magnet
B	iron	temporary magnet
C	steel	permanent magnet
D	steel	temporary magnet

[Turn over

24 A plastic rod and a dry cloth are uncharged.

The rod is now rubbed with the cloth and they both become charged. The rod becomes negatively charged because some charged particles move from the cloth to the rod.

What is the charge on the cloth and which particles moved in the charging process?

	charge on cloth	particles that moved
A	negative	electrons
B	negative	neutrons
C	positive	electrons
D	positive	neutrons

25 A power supply of electromotive force (e.m.f.) 12 V is connected across a 3 Ω resistor.

Which ammeter is most suitable to measure the current in the resistor?

A an ammeter with a range 0–0.5 A

B an ammeter with a range 0–1 A

C an ammeter with a range 0–5 A

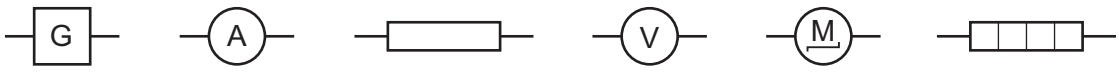
D an ammeter with a range 0–50 A

26 The cost of electrical energy is $0.25 for each unit of 1 kW h. A 2200 W heater is switched on for 48 minutes.

What is the cost of this use?

A $0.44 **B** $0.55 **C** $26 **D** $440

27 The diagram shows six different electrical circuit components.



Which circuit symbol is **not** present in the diagram?

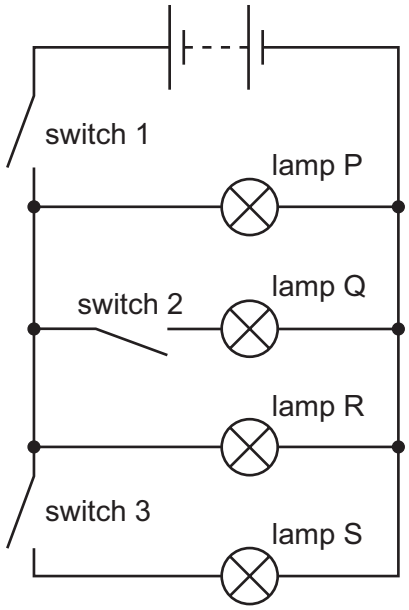
A resistor

B voltmeter

C generator

D thermistor

28 The circuit shown contains three switches and four lamps P, Q, R and S.



Which switches must be closed to light only lamps P and R?

A switch 1 only

B switch 1 and switch 2

C switch 1 and switch 3

D switch 2 and switch 3

29 An electric heater has a metal frame.

The heating element is connected to the live and neutral wires of an a.c. supply. The metal frame is connected to the earth wire.

Which row gives the correct connections for the fuse and the switch?

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

[Turn over

30 Which electrical device uses the turning effect produced by a current-carrying coil in a magnetic field?

A a.c. generator

B d.c. motor

C relay

D transformer

31 Four appliances all use an electric current to operate.

Which appliance uses the magnetic effect of the current?

A a heater

B a light bulb

C a relay

D a remote controller

32 A student makes four different types of transformer. She counts the number of turns on the primary and secondary coils. She labels each transformer as either step-up or step-down.

Which row shows the correct labels?

	number of turns on the primary coil	number of turns on the secondary coil	step-up or step-down transformer
A	5	5	step-up
B	10	5	step-up
C	10	20	step-down
D	20	10	step-down

33 How is electricity transmitted over large distances and why is it transmitted in this way?

	how	why
A	at high voltage	for safety
B	at high voltage	to reduce energy loss
C	at low voltage	for safety
D	at low voltage	to reduce energy loss

34 An atom of an element contains electrons, neutrons and protons.

Which particles are found in the nucleus?

A electrons and neutrons only

B electrons and protons only

C neutrons and protons only

D electrons, neutrons and protons

35 A nuclide of chlorine has the symbol shown.

$$^{35}_{17}Cl$$

What is the nucleon number of this nuclide of chlorine?

A 17 **B** 18 **C** 35 **D** 52

36 What is a major source of background radiation?

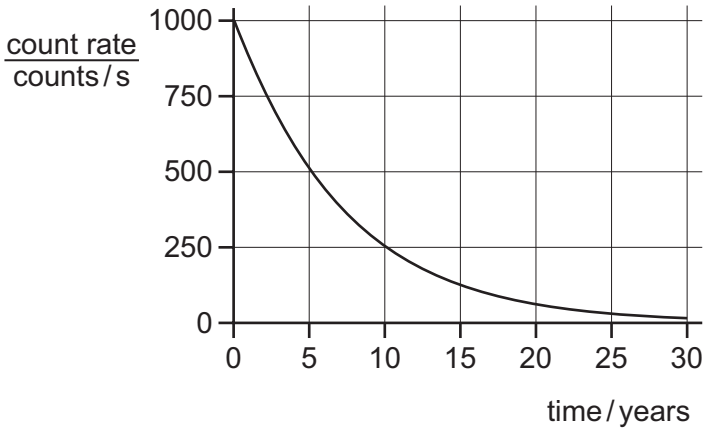
A cosmic rays

B microwaves from mobile (cell) phones

C nuclear power stations

D visible light from the Sun

37 The graph shows the radioactive decay curve of a substance.



What is the half-life of this substance?

A 0.5 years **B** 5 years **C** 15 years **D** 30 years

38 Which row about the orbits of the Earth and the Moon is correct?

	approximate time for the Earth to orbit the Sun	approximate time for the Moon to orbit the Earth
A	1 day	30 days
B	30 days	1 day
C	365 days	1 day
D	365 days	30 days

39 Which description of a galaxy is correct?

A a collection of billions of stars

B a collection of gaseous planets orbiting a star

C a collection of rocky planets orbiting a star

D all of the stars that exist

40 Light from distant stars is redshifted.

What is redshift?

A a decrease in observed wavelength caused by a star moving away from the Earth

B a decrease in observed wavelength caused by a star moving towards the Earth

C an increase in observed wavelength caused by a star moving away from the Earth

D an increase in observed wavelength caused by a star moving towards the Earth

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