Cambridge Assessment International Education

Cambridge IGCSE™

PHYSICS **0625/13**

Paper 1 Multiple Choice (Core) **October/November 2020**

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 10 N (acceleration of free fall = 10 m / s^2).

INFORMATION

- The total mark for this paper is 40.
- Each correct answer will score one mark. A mark will not be deducted for a wrong answer.
- Any rough working should be done on this question paper.

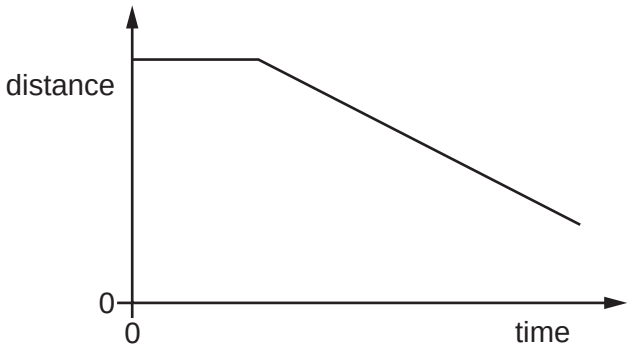
This document has **16** pages. Blank pages are indicated.

1 A student uses a metre rule to measure the length of a sheet of paper.

Which measurement is shown to the nearest millimetre?

A 0.3 m **B** 0.29 m **C** 0.293 m **D** 0.2932 m

2 The diagram shows the distance–time graph for the motion of an object.



How can the motion of the object be described?

A at rest, then constant deceleration

B at rest, then constant speed

C constant speed, then constant acceleration

D constant speed, then constant deceleration

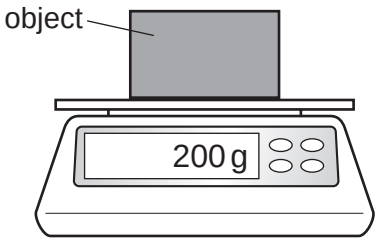
3 An athlete runs 300 m up a hill in 100 s.

She then runs down the same hill in 50 s.

What is her average speed for the whole run?

A 2.0 m/s **B** 4.0 m/s **C** 8.0 m/s **D** 9.0 m/s

4 The diagram shows an object on a balance. The reading on the balance is shown.



Which quantity is shown?

A the mass of the object

B the pressure exerted by the object

C the volume of the object

D the weight of the object

5 Which quantity is weight an example of?

A acceleration

B force

C mass

D pressure

6 A student is asked to predict whether a solid floats in a liquid.

Which information does the student require?

A the density of the liquid and the mass of the solid

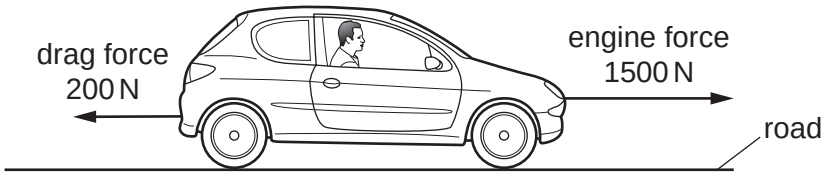
B the density of the solid and the density of the liquid

C the density of the solid and the mass of the liquid

D the mass of the solid and the mass of the liquid

7 The diagram shows a car moving along a road.

The force due to the engine is 1500 N and the total drag force is 200 N.



What is the motion of the car?

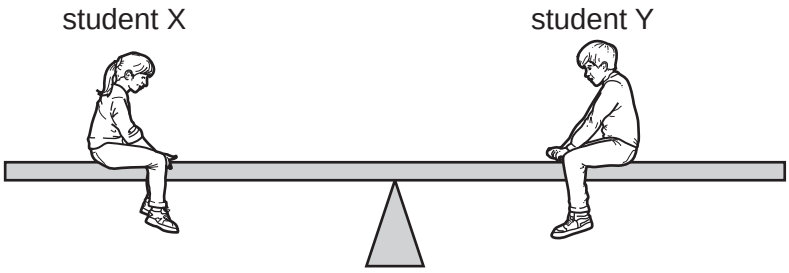
A constant speed

B decreasing speed

C increasing speed

D reversing

8 Students X and Y are sitting on a seesaw. Student X has a weight of 400 N and student Y has a weight of 600 N. The seesaw is in equilibrium.



Which statement correctly describes why the seesaw is in equilibrium?

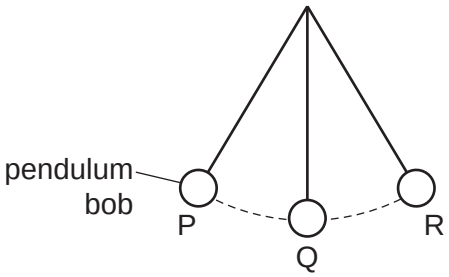
A The resultant force is zero and the resultant moment is zero.

B The resultant force is 200 N and the resultant moment is zero.

C The sum of the downward forces is zero and the resultant moment is zero.

D The total downward force is 1000 N and the resultant moment is 200 N m.

9 The diagram shows a frictionless pendulum.



The pendulum bob swings from point P through point Q to point R then back to P.

At which point is the energy of the pendulum bob greatest?

A at point P

B at point Q

C at point R

D it is the same at points P, Q and R

10 Which statement correctly compares the production of electricity using wind and the production of electricity using nuclear fission?

A Wind is less reliable than nuclear fission; both wind and nuclear fission are renewable.

B Wind is less reliable than nuclear fission; wind is renewable, but nuclear fission is not.

C Wind is more reliable than nuclear fission; both wind and nuclear fission are renewable.

D Wind is more reliable than nuclear fission; wind is renewable, but nuclear fission is not.

11 To calculate the power produced by a force, the size of the force must be known.

What else needs to be known to calculate the power?

	the distance that the force moves the object	the time for which the force acts on the object
A	✓	✓
B	✓	✗
C	✗	✓
D	✗	✗

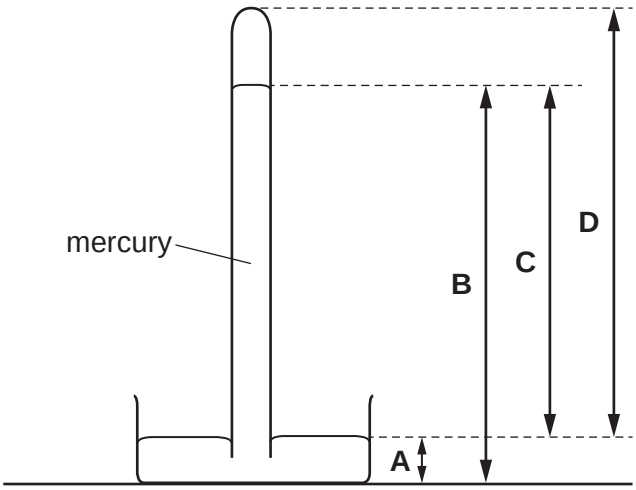
key

✓ = needed

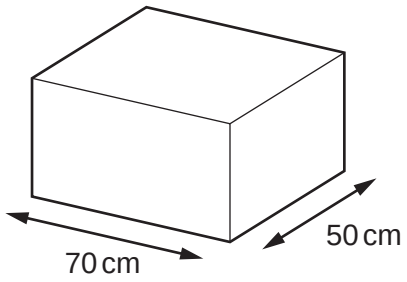
✗ = not needed

12 The diagram shows a mercury barometer.

Which height is used as a measurement of atmospheric pressure?



13 A large box has a weight of 700 N. The box is placed on the floor.



What is the pressure on the floor due to the box?

A $0.20\,N/m^2$ **B** $10\,N/m^2$ **C** $245\,N/m^2$ **D** $2000\,N/m^2$

14 On a warm day, a driver checks the air pressure in a car tyre. At night, the temperature drops and the air pressure in the tyre decreases. There are no air leaks in the tyre.

Why does the pressure decrease?

A The air molecules in the tyre move more slowly.

B The air molecules in the tyre stop moving.

C The volume of the air in the tyre decreases.

D The volume of the air in the tyre increases.

15 A textbook gives the description of a thermal process as ‘more-energetic molecules escape from the surface of a liquid which causes the liquid to cool’.

Which process is being described?

A boiling

B Brownian motion

C condensation

D evaporation

16 Which physical property changes when temperature is measured with a liquid-in-glass thermometer?

A electromotive force

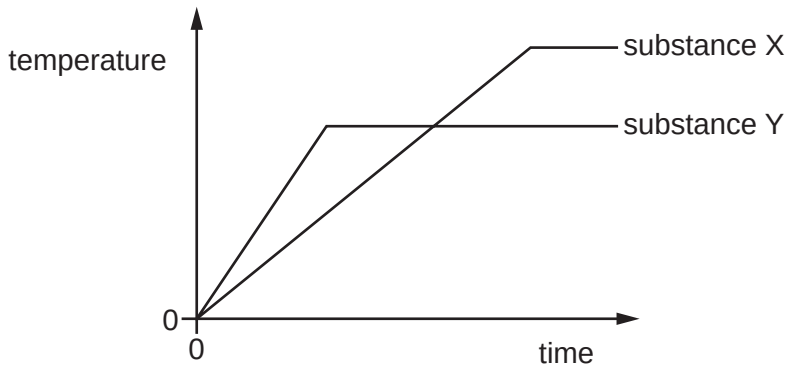
B pressure

C resistance

D volume

17 Two different pure substances X and Y are heated. Both substance X and substance Y are initially in the solid state.

The graph shows how the temperature of each substance changes with time.



What does the graph tell us about the substances?

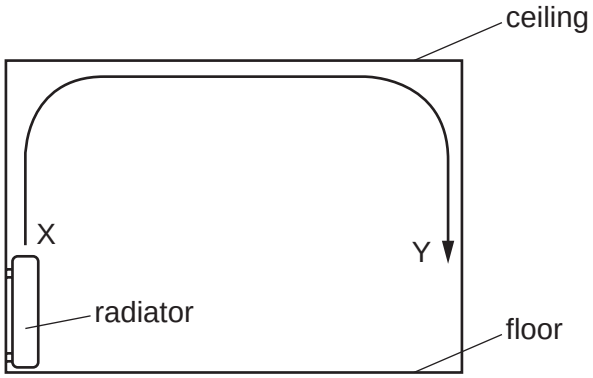
A Substance X has a lower boiling point than substance Y.

B Substance X has a lower melting point than substance Y.

C Substance Y has a lower boiling point than substance X.

D Substance Y has a lower melting point than substance X.

18 The diagram shows the view of a room heated by a radiator. The arrowed line from X to Y is the path of the convection current in the air.



Which row about the air temperature and the air density at X and at Y is correct?

	air temperature	air density
A	higher at X	higher at X
B	higher at X	higher at Y
C	higher at Y	higher at Y
D	higher at Y	higher at X

19 Which thermal process can transfer energy through a vacuum?

A conduction

B convection

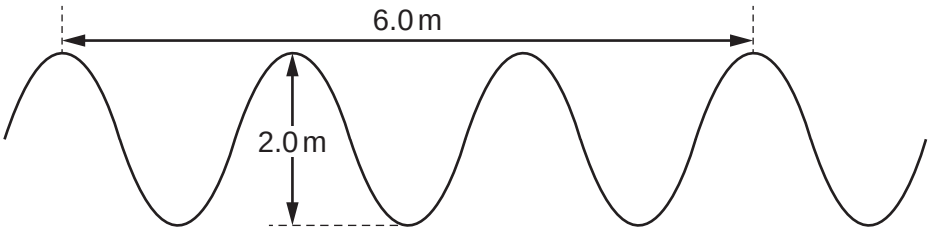
C evaporation

D radiation

20 Which row correctly describes light waves?

	wave type	direction of vibrations
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

21 The diagram shows a wave. It is not drawn to scale.



What are the amplitude and the wavelength of the wave?

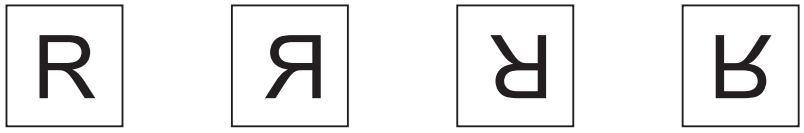
	amplitude / m	wavelength / m
A	1.0	1.0
B	1.0	2.0
C	2.0	2.0
D	2.0	3.0

22 A boy is having his eyes tested. A letter is printed on a card placed over his head. He sees the card in a plane mirror placed on the far wall of the room.

He sees the letter 'R' in the mirror.

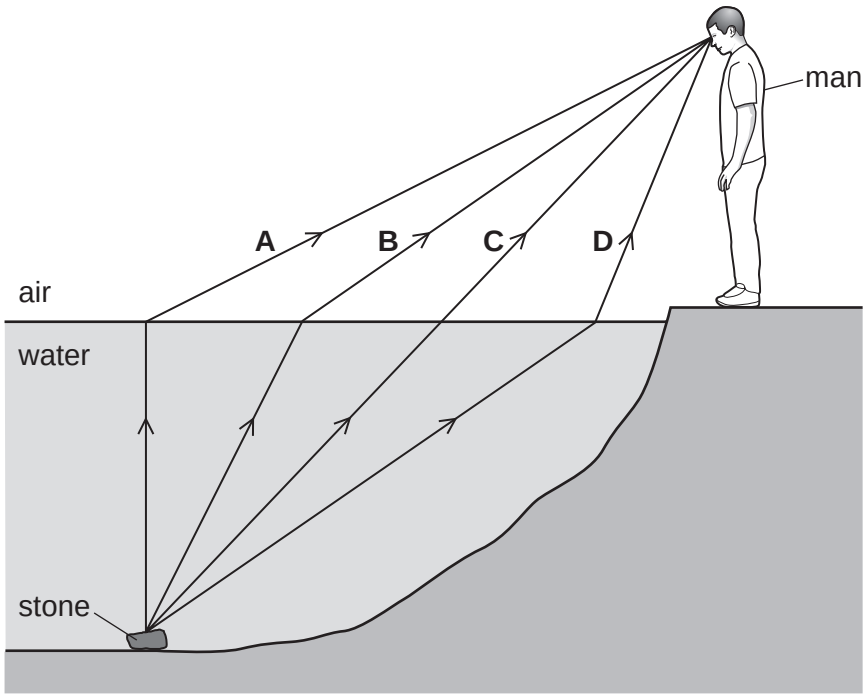
How is it printed on the card?

A **B** **C** **D**

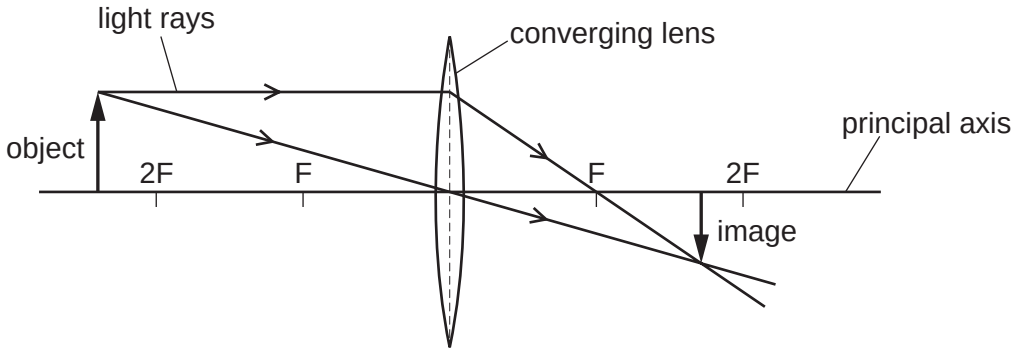


23 A man sees a stone at the bottom of a pool of water.

Which path could be taken by light from the stone to the man?



24 The diagram shows the image made by a converging lens.



Which statement describes the image formed?

A diminished and inverted

B diminished and upright

C enlarged and inverted

D enlarged and upright

25 The diagram shows three types of electromagnetic radiation listed in a particular order. The electromagnetic radiation is travelling in a vacuum.

Which quantities increase in magnitude going from left to right across the list?

A frequency only

B neither speed nor frequency

C speed and frequency

D speed only

26 A police car with its siren sounding is stationary in heavy traffic. A pedestrian notices that, although the loudness of the sound produced does not change, the pitch varies.

Which row describes the amplitude and the frequency of the sound?

	amplitude	frequency
A	constant	constant
B	constant	varying
C	varying	constant
D	varying	varying

27 Diagrams 1, 2 and 3 show an experiment to compare two magnets 1 and 2.

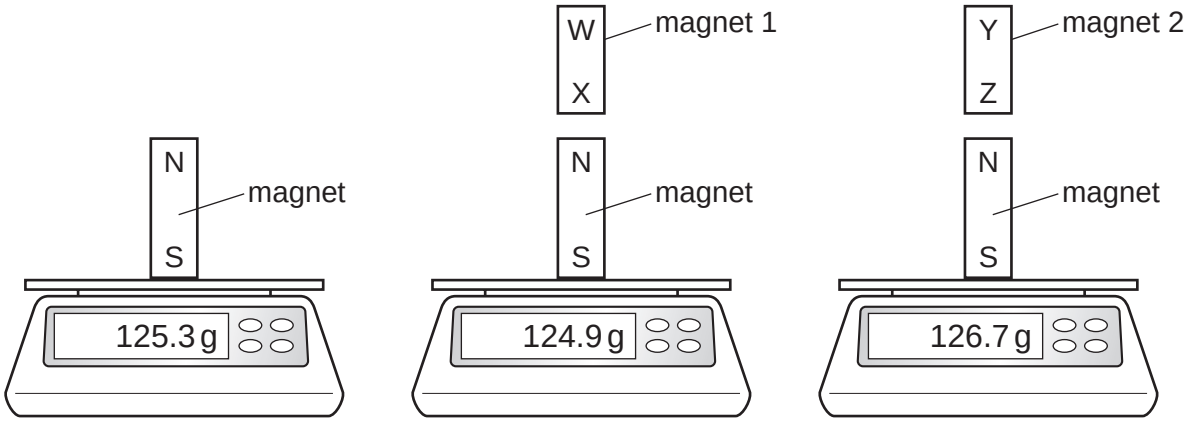


diagram 1 diagram 2 diagram 3

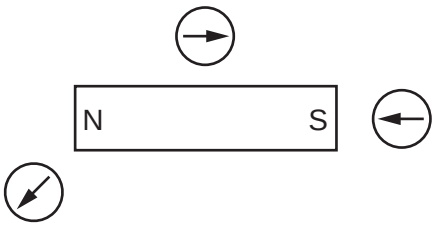
Which row explains the readings on the balances?

	polarity of magnet 1	polarity of magnet 2
A	X is an N pole	Z is an N pole
B	X is an N pole	Z is an S pole
C	X is an S pole	Z is an N pole
D	X is an S pole	Z is an S pole

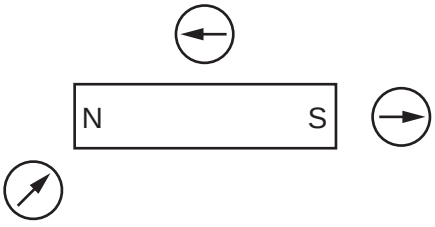
28 A student uses three small plotting compasses to investigate the magnetic field around a bar magnet.

Which diagram shows the directions in which the compass needles point?

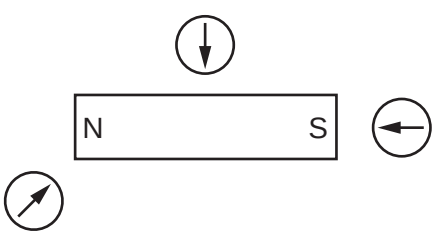
A



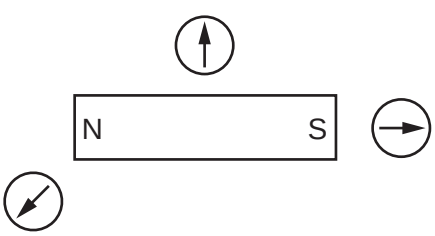
B



C



D



29 Which statement about charging an insulator is correct?

A It can be given an electrostatic charge by placing it in a magnetic field.

B It can be given an electrostatic charge by connecting it to a battery.

C It can be given an electrostatic charge by friction.

D It cannot be given an electrostatic charge.

30 Each diagram shows part of a circuit. The circle represents an instrument used to measure the potential difference (p.d.) across the resistor.

diagram 1

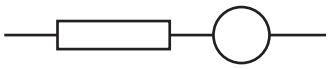
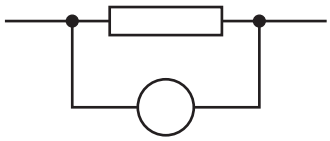


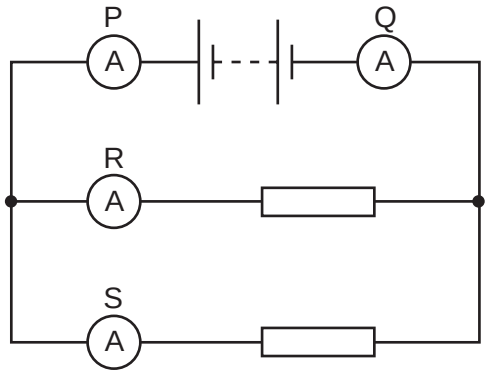
diagram 2



Which row is correct?

	the unit of p.d.	diagram which shows the meter correctly connected
A	amperes	diagram 1
B	amperes	diagram 2
C	volts	diagram 1
D	volts	diagram 2

31 A student uses four ammeters P, Q, R and S to measure the current in different parts of the circuit shown.



Which two ammeters read the largest current?

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

32 Three statements about a relay are given.

1 A relay has a coil that becomes a temporary magnet when in operation.

2 A large current in a relay coil is used to switch off a smaller current.

3 A small current in a relay coil is used to switch on a larger current.

Which statements are correct?

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

33 An electrical appliance is powered from a mains supply.

The appliance normally uses a current of 3 A, but the current briefly rises to 4 A at the instant the appliance is switched on. The cable to the appliance is designed for currents up to 6 A.

A fuse is used to protect the circuit.

What should be the rating of the fuse?

A 1 A **B** 3 A **C** 5 A **D** 13 A

34 When a metal wire moves up, cutting a magnetic field, an electromotive force (e.m.f.) is induced across the wire.

Which change affects the magnitude of the induced e.m.f.?

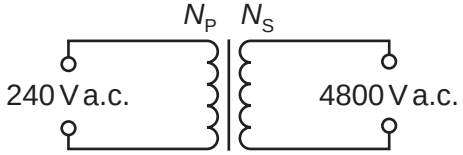
A moving the wire down at the same speed

B moving the wire up at a faster speed

C using a thicker wire

D using a wire made from a different metal

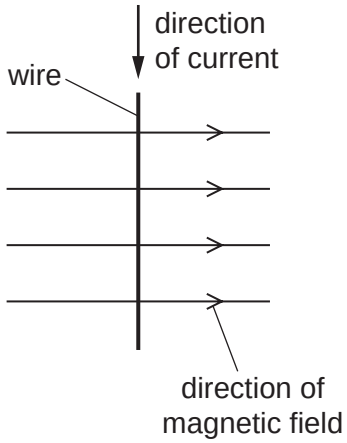
35 A transformer is needed to convert a supply of 240 V a.c. into 4800 V a.c..



Which pair of coils would be suitable for this transformer?

	number of turns on primary coil N_P	number of turns on secondary coil N_S
A	50	1 000
B	240	48 000
C	480	24
D	2000	100

36 The diagram shows a wire carrying a current in the direction shown. There is a magnetic field acting from left to right. The wire experiences a force acting out of the page.



The current is now reversed.

In which direction does the force on the wire now act?

A into the page

B out of the page

C to the left

D to the right

37 Which statement is correct for the nucleus of **any** atom?

A The nucleus contains electrons, neutrons and protons.

B The nucleus contains the same number of protons as neutrons.

C The nucleus has a total charge of zero.

D The nucleus is very small compared with the size of the atom.

38 How many protons and how many neutrons are in a nucleus of $^{234}_{90}\mathrm{Th}$?

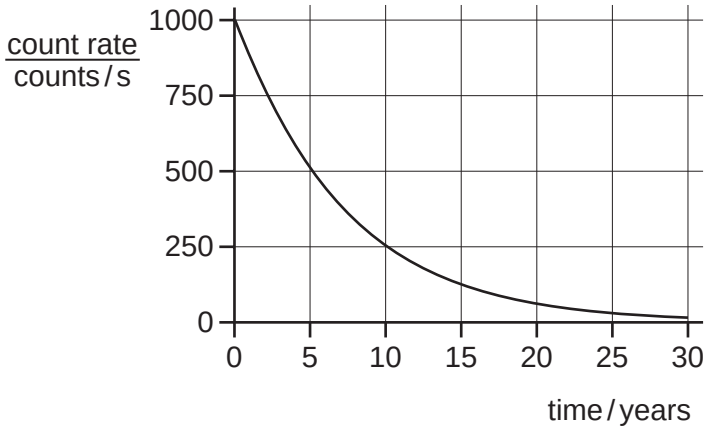
	protons	neutrons
A	90	144
B	90	234
C	144	90
D	234	90

39 A radiation detector in a laboratory is measuring background radiation.

Which row describes the readings and the cause?

	readings	cause
A	vary with no pattern	background radiation is random
B	vary with no pattern	radiation detectors are unstable
C	slowly increase during the day	background radiation increases as temperature increases
D	slowly reduce during the day	background radiation decreases as temperature increases

40 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