



Cambridge IGCSE™

CO-ORDINATED SCIENCES

0654/13

Paper 1 Multiple Choice (Core)

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.
- The Periodic Table is printed in the question paper.

This document has **16** pages. Any blank pages are indicated.



1 Which part of a plant cell allows the movement of substances into and out of the cell?

- A cell membrane
- B cell wall
- C nucleus
- D vacuole

2 Which row matches the nutrient to the chemical elements that it contains?

	nutrient	carbon	hydrogen	oxygen	nitrogen
A	fat	✓	✓	✗	✗
B	protein	✓	✓	✓	✓
C	starch	✓	✗	✓	✓
D	glucose	✗	✓	✓	✓

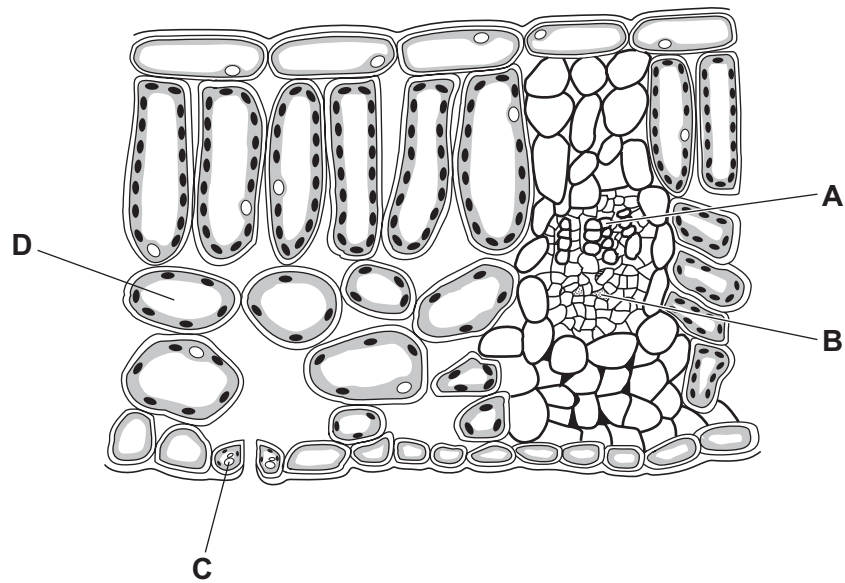
3 Some species of bacteria live in alkaline hot springs at temperatures of 80 °C.

Which conditions will best suit the enzymes of these bacteria?

	temperature / °C	pH
A	30	3
B	30	9
C	70	3
D	70	9

- 4 The diagram shows a cross-section of a leaf.

Which structure is a xylem cell?

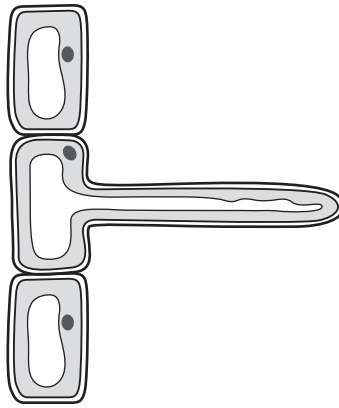


- 5 There was an increase of 27% in the number of hospital admissions related to scurvy between 2009 and 2014.

Which row explains this change?

	diet contains	number of people
A	too little vitamin C	decrease
B	too little vitamin D	decrease
C	too little vitamin C	increase
D	too little vitamin D	increase

- 6 The diagram shows a root hair cell and some of the adjacent cells.



Which statement about the root hair cell compared to the other cells in the diagram is correct?

- A It has less cytoplasm.
 - B It has a smaller vacuole.
 - C It has a larger surface area.
 - D It has no nucleus.
- 7 What leads to coronary heart disease?
- A Coronary arteries become blocked.
 - B Coronary arteries become enlarged.
 - C Heart muscles become enlarged.
 - D Heart muscles do **not** contract.
- 8 A student runs 5 km.

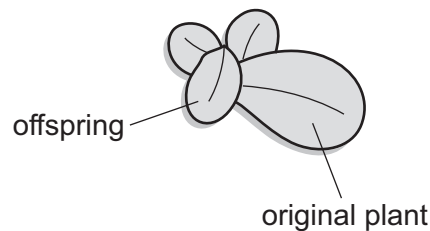
Which statement describes the change in the student's breathing 5 minutes after the run ends?

- A Depth decreases and rate decreases.
- B Depth decreases and rate increases.
- C Depth increases and rate decreases.
- D Depth increases and rate increases.

9 Which row shows the effect of adrenaline?

	effect on pupil diameter	effect on heart rate
A	narrows	decreases
B	widens	decreases
C	narrows	increases
D	widens	increases

10 A certain aquatic plant reproduces by forming offspring from the original plant.



Which statement describes the reproduction of this aquatic plant?

- A** asexual reproduction which produces genetically different plants
 - B** asexual reproduction which produces genetically identical plants
 - C** sexual reproduction which produces genetically different plants
 - D** sexual reproduction which produces genetically identical plants
- 11 Two parents with genotypes of BB and Bb are crossed.
- What is the predicted ratio of genotypes in the offspring?
- A** 1 BB : 1 Bb **B** 1 Bb : 1 bb **C** 3 BB : 1 Bb **D** 3 Bb : 1 BB
- 12 Three stages involved in the selective breeding of wheat to increase the size of the seeds are shown.
- 1 crossing wheat plants to produce the next generation
 - 2 selection by humans of wheat with large seeds
 - 3 selection of wheat offspring with large seeds

What is the correct sequence of these stages?

- A** 1 → 2 → 3 **B** 2 → 1 → 3 **C** 2 → 3 → 1 **D** 3 → 1 → 2

13 What are undesirable effects of deforestation?

- A** habitat creation and decreased carbon dioxide in the atmosphere
- B** habitat creation and increased carbon dioxide in the atmosphere
- C** habitat destruction and decreased carbon dioxide in the atmosphere
- D** habitat destruction and increased carbon dioxide in the atmosphere

14 A mixture contains carbon, potassium nitrate and sulfur.

Which description of this mixture is correct?

- A** one compound and two elements
- B** two compounds and one element
- C** three elements
- D** four elements

15 Atoms consist of protons, neutrons and electrons.

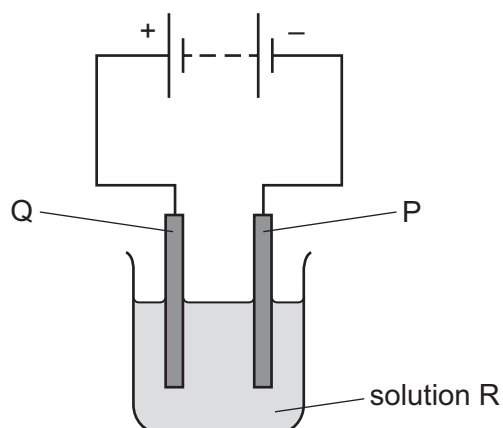
Which statement is correct?

- A** An electron has a relative mass of 1 and a negative charge.
- B** A proton has a relative mass of 1 and a positive charge.
- C** A proton has a relative mass of less than 1 and a negative charge.
- D** A neutron has a relative mass of less than 1 and no charge.

16 Which statement about simple molecules is correct?

- A** They contain both metallic and non-metallic elements.
- B** They have good electrical conductivity.
- C** They contain covalent bonds.
- D** They have high melting points.

17 The apparatus for the electrolysis of solution R is shown.



What are the names of P, Q and R?

	P	Q	R
A	anode	cathode	electrode
B	anode	cathode	electrolyte
C	cathode	anode	electrode
D	cathode	anode	electrolyte

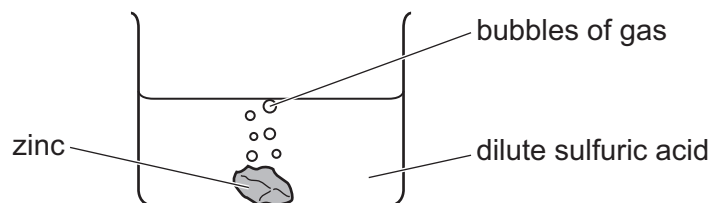
18 Which row describes an endothermic reaction?

	thermal energy is transferred to the surroundings	the temperature of the reaction mixture decreases
A	✓	✓
B	✓	x
C	x	✓
D	x	x

19 Which change is a chemical change?

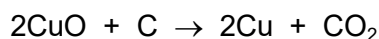
- A** boiling water
- B** combustion of alkanes
- C** filtering a mixture of sand and water
- D** fractional distillation of petroleum

- 20 The diagram shows zinc reacting with dilute sulfuric acid.



Which change does **not** increase the rate of the reaction?

- A Add a catalyst.
 - B Increase the concentration of dilute sulfuric acid.
 - C Increase the temperature of dilute sulfuric acid.
 - D Decrease the surface area of zinc.
- 21 The equation for the reaction between copper(II) oxide and carbon is shown.



Which substance is oxidised in this reaction?

- A C
 - B CO_2
 - C Cu
 - D CuO
- 22 Substance Y is added to water containing universal indicator.

The pH of the mixture increases.

What is Y?

- A HCl
 - B K
 - C NaCl
 - D SO_2
- 23 An acid reacts with an alkali to produce an aqueous solution of a salt.

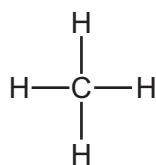
Which procedure is used to obtain crystals of the salt from the solution?

- A Distil the solution.
- B Evaporate the solution to dryness.
- C Filter the solution.
- D Partially evaporate the solution and leave it to cool.

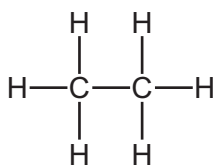
24 Which statement about elements in the Periodic Table is correct?

- A** The density of the elements in Group I increases up the group.
- B** The metallic character of the elements increases across a period from left to right.
- C** The number of protons in the atoms of the elements increases across a period from left to right.
- D** The reactivity of the elements in Group VII increases down the group.

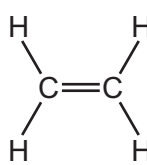
25 The displayed formulas of four compounds are shown.



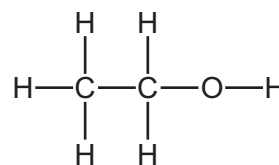
1



2



3



4

Which formulas represent ethanol and ethene?

	ethanol	ethene
A	4	2
B	1	3
C	4	3
D	2	1

26 Which statement about fossil fuels is correct?

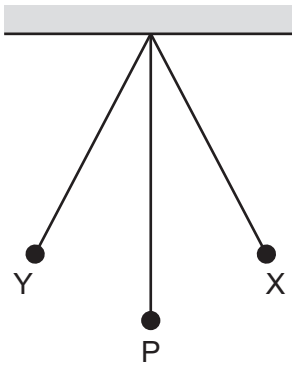
- A** Ethane is the main constituent of natural gas.
- B** Gas oil is used as a fuel in diesel engines.
- C** Naphtha is used for heating and cooking.
- D** Petroleum is used as a fuel in car engines.

27 Acidified aqueous silver nitrate is added to a solution.

Which ion causes a white precipitate to form?

- A** chloride ions, Cl^-
- B** copper ions, Cu^{2+}
- C** hydroxide ions, OH^-
- D** sodium ions, Na^+

- 28 A pendulum swings backwards and forwards between point X and point Y.



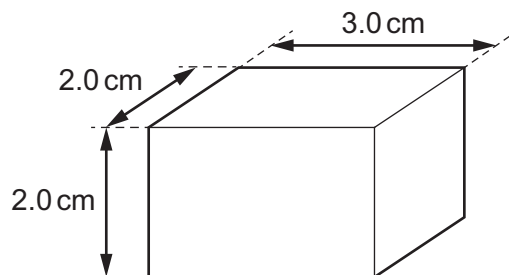
A student starts a stop-watch as the pendulum first passes point P.

The student stops the stop-watch when he counts that the pendulum passes point P another 10 times.

The time on the stop-watch is 8.0 s.

What is the period of the pendulum?

- A** 0.40 s **B** 0.80 s **C** 1.6 s **D** 8.0 s
- 29 The diagram shows a solid rectangular block made of material of density 2.0 g/cm^3 .



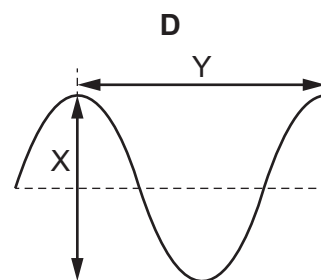
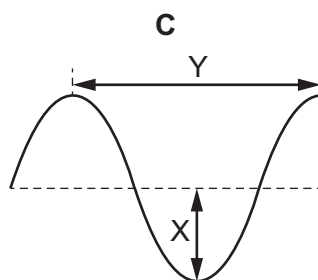
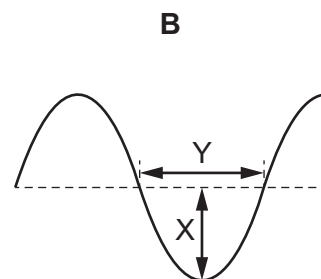
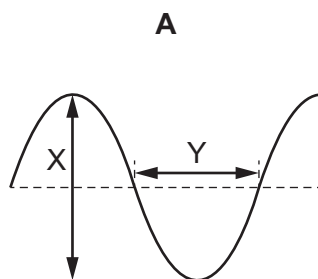
What is the mass of the block?

- A** 2.0 g **B** 6.0 g **C** 14 g **D** 24 g
- 30 A student runs up some stairs.

Which quantities are used to calculate the power of the student?

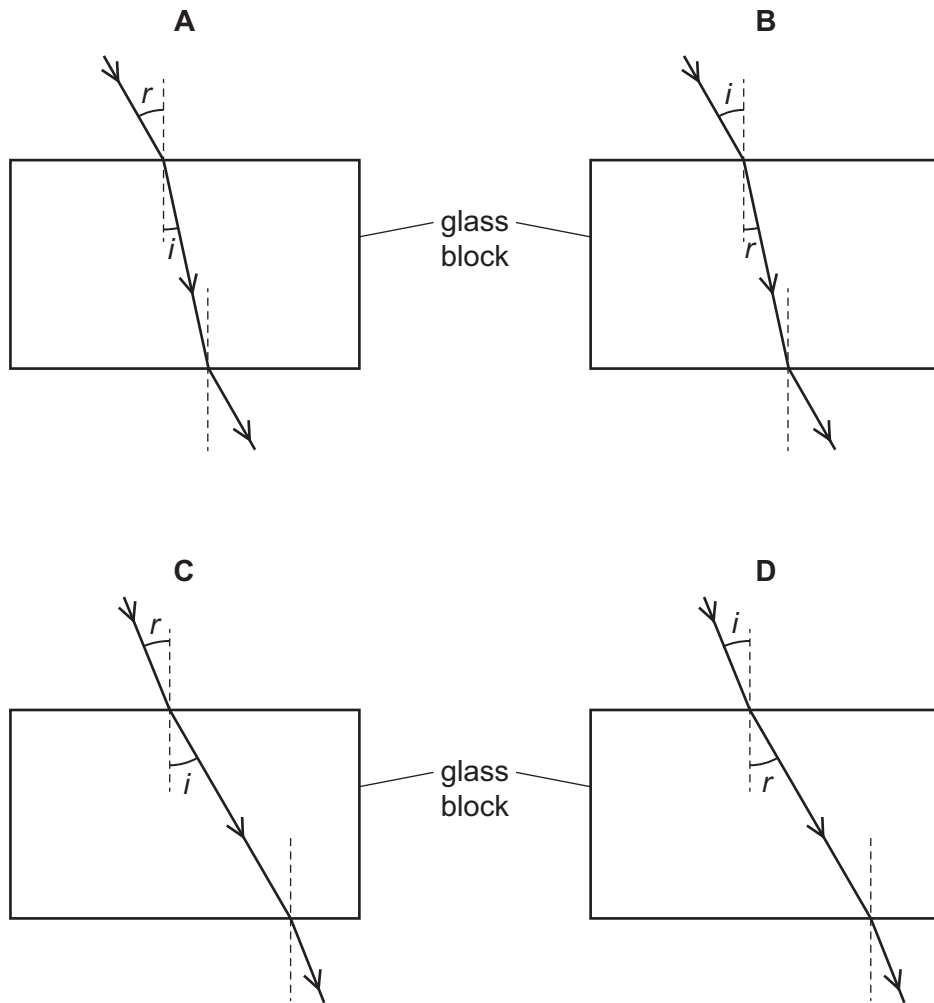
- A** the weight of the student and the vertical distance moved
B the weight of the student and the time taken
C the work done by the student and the vertical distance moved
D the work done by the student and the time taken

- 31** Which statement describes the behaviour of particles during the evaporation of a liquid?
- A** Only the more energetic particles escape.
 - B** Particles bond together.
 - C** Particles move closer together.
 - D** The least energetic particles escape first.
- 32** What is the method of thermal energy transfer from the Sun to the Earth through the vacuum of space?
- A** conduction
 - B** convection
 - C** evaporation
 - D** radiation
- 33** Which statement about waves is correct?
- A** They do not transfer energy or matter.
 - B** They transfer energy and matter.
 - C** They transfer energy but not matter.
 - D** They transfer matter but not energy.
- 34** Which wave diagram shows the amplitude X and the wavelength Y of a wave?



35 Light travelling in air passes through a glass block.

Which diagram shows the refraction of the light, with the angle of incidence labelled i and the angle of refraction labelled r ?



36 Which quantity is a flow of electrons through an electrical conductor?

- A current
- B power
- C resistance
- D voltage

- 37 The table shows the voltage across and the current in four lamps.

Which lamp has the greatest resistance?

	voltage / V	current / A
A	2.0	0.40
B	4.0	0.50
C	6.0	2.0
D	12	3.0

- 38 A $4.0\ \Omega$ resistor is connected in parallel with an $8.0\ \Omega$ resistor.

What is their combined resistance?

- A** less than $4.0\ \Omega$
- B** between $4.0\ \Omega$ and $8.0\ \Omega$
- C** between $8.0\ \Omega$ and $12.0\ \Omega$
- D** exactly $12.0\ \Omega$
- 39 A box is made from aluminium that is 20 mm thick.
- Which statement explains why this box is **not** used to store all types of radioactive materials?
- A** It only prevents the escape of α -particles and β -particles.
- B** It only prevents the escape of α -particles.
- C** It only prevents the escape of β -particles and γ -rays.
- D** It only prevents the escape of γ -rays.
- 40 Which type of force keeps an object in orbit around the Sun and which type of force forms a protostar?

	force keeping an object in orbit around the Sun	force that forms a protostar
A	gravitational	magnetic
B	gravitational	gravitational
C	magnetic	magnetic
D	magnetic	gravitational

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lanthanoids

The volume of one mole of any gas is 24 dm^3 at room temperature and pressure (r.t.p.).

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