Cambridge Assessment International Education

Cambridge IGCSE™ (9–1)

CO-ORDINATED SCIENCES **0973/11**

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

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 characteristic of a living organism releases energy for growth?

A excretion

B reproduction

C respiration

D sensitivity

2 A student draws a diagram of a chicken's egg and includes the magnification, m, of the drawing.

The student writes m = ×2.

The image length on the diagram is 140 mm.

What is the length of the actual chicken's egg?

A 35 mm **B** 70 mm **C** 140 mm **D** 280 mm

3 Which colour does Benedict's solution change to when heated with a reducing sugar?

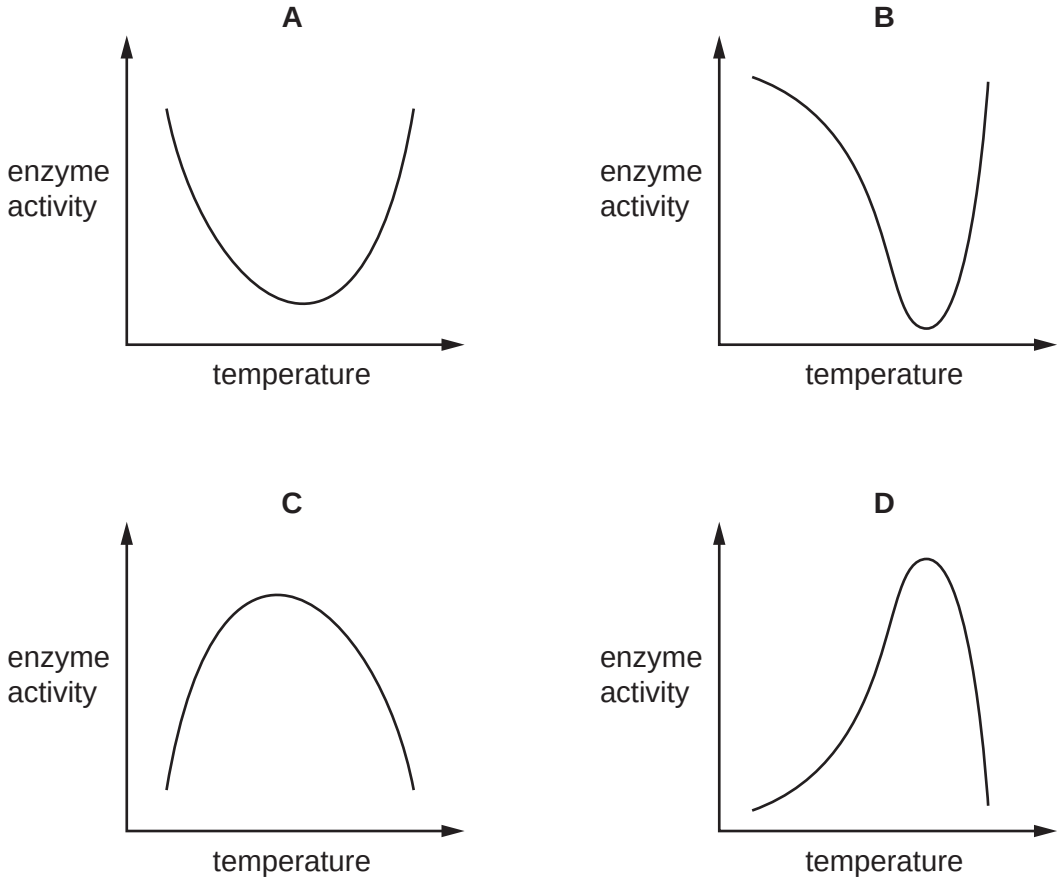
A blue

B blue-black

C orange

D purple

4 Which graph shows the effect of temperature on enzyme activity?



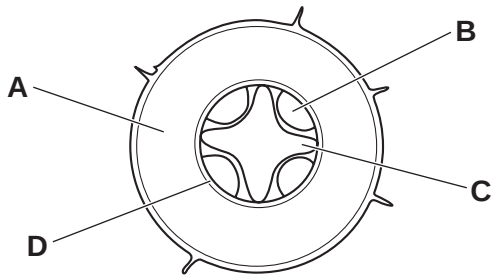
5 Which conditions will result in the highest rate of photosynthesis?

	light intensity	carbon dioxide concentration
A	high	high
B	high	low
C	low	high
D	low	low

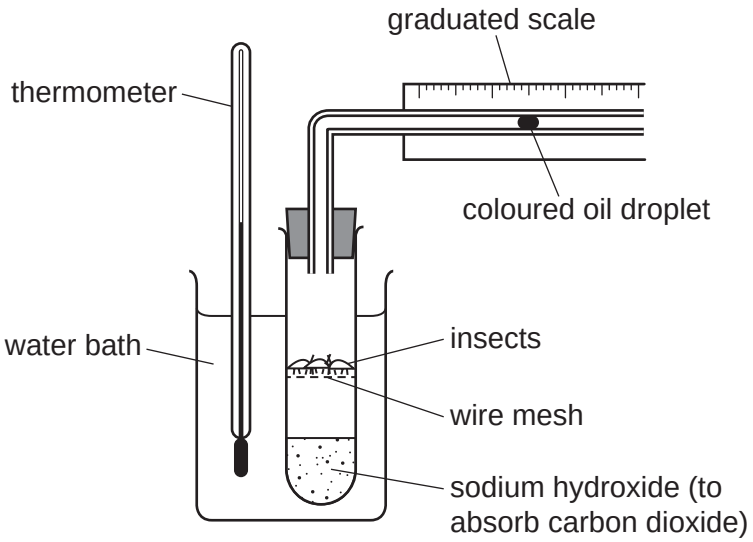
6 Which row about food groups is correct?

	food group	main function	food source examples
A	carbohydrate	provide energy	bread, pasta, rice
B	fat	tissue growth and repair	bread, pasta, rice
C	fibre	tissue growth and repair	fish, meat, seeds
D	protein	provide energy	fish, meat, seeds

7 Which label shows the position of the xylem in the cross-section of the root of a dicotyledonous plant?



8 The apparatus shown is set up and left for 10 minutes. The insects are able to move around in the test-tube but the wire mesh prevents them from falling into the sodium hydroxide.



In which direction does the oil droplet move and why?

	direction of oil droplet	effect of respiration of insects
A	to the left	use up carbon dioxide and release oxygen
B	to the left	use up oxygen and release carbon dioxide
C	to the right	use up carbon dioxide and release oxygen
D	to the right	use up oxygen and release carbon dioxide

9 One response to a frightening situation is an increase in heart rate caused by the release of adrenaline.

Which statement about adrenaline is correct?

A It is an enzyme produced by an organ and travels in the blood to the heart.

B It is an enzyme produced by an organ and travels down a nerve to the brain.

C It is a hormone produced by a gland and travels in the blood to the heart.

D It is a hormone produced by a gland and travels down a nerve to the brain.

10 Which part of the male reproductive system is correctly matched to its function?

	part	function
A	prostate gland	transfers sperm to the urethra
B	scrotum	holds the testes outside of body
C	testes	secrete fluids for sperm to swim in
D	urethra	transfers semen to ovary

11 Continuous variation is defined as a .....1..... of phenotypes .....2..... .

Which words correctly complete gaps 1 and 2?

	1	2
A	limited number	between two extremes
B	limited number	with no intermediates
C	range	between two extremes
D	range	with no intermediates

12 In a food chain, what do all living organisms get from their food?

A a supply of water

B oxygen for respiration

C protection from disease

D the energy they need

13 Forests are cut down and burnt in deforestation programmes.

As a result of this, which gas in the atmosphere increases in concentration?

A carbon dioxide

B hydrogen

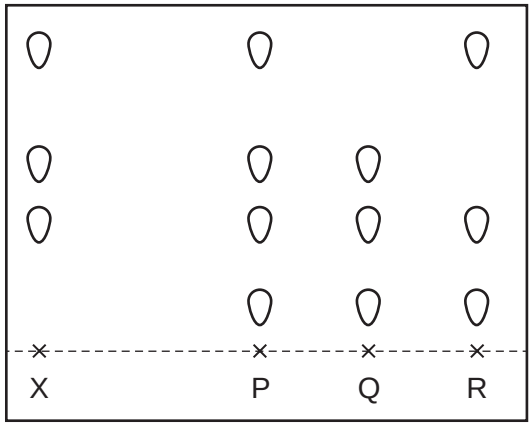
C nitrogen

D oxygen

14 Dye X is a mixture of different coloured substances.

Chromatography is used to compare X with three other mixtures, P, Q and R.

The results are shown.



Which mixtures contain dye X?

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

15 What do the chemical symbols N_2 and Ni represent?

	N_2	Ni
A	a compound	a compound
B	a compound	an element
C	an element	a compound
D	an element	an element

16 The nucleon number of a hydrogen atom is 1.

What is present inside the nucleus of this atom?

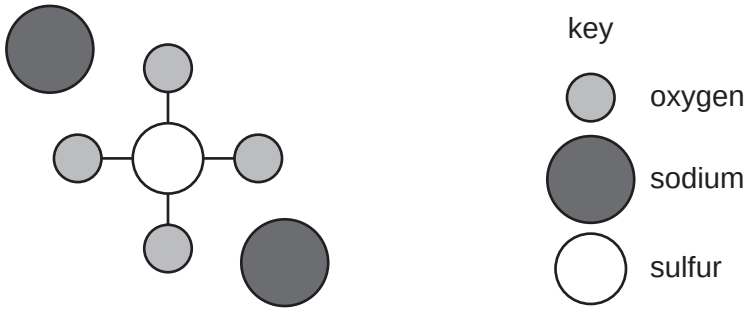
A one proton and one electron

B one proton and one neutron

C one proton only

D one neutron only

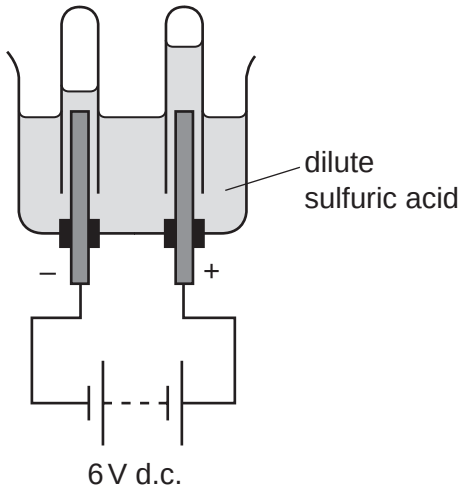
17 The diagram represents an ionic compound formed from three types of atom.



What is the chemical formula for this compound?

A Na_2S_4O **B** NaO_4S_2 **C** Na_2SO_4 **D** S_4O_2Na

18 The diagram shows the electrolysis of dilute sulfuric acid using inert electrodes.



Which substance is produced by electrolysis at the negative electrode?

A hydrogen

B oxygen

C sulfur dioxide

D water vapour

19 When petrol burns in a car engine, carbon monoxide, CO, and nitrogen monoxide, NO, are produced.

These gases pass through a catalytic converter where carbon monoxide reacts with nitrogen monoxide.

The equation for the reaction is shown.

carbon monoxide + nitrogen monoxide → nitrogen + carbon dioxide

Which statement is **not** correct?

A Carbon monoxide is oxidised in the catalytic converter.

B Carbon monoxide is produced by the complete combustion of petrol.

C Nitrogen from the air is oxidised in the car engine.

D Nitrogen monoxide is reduced in the catalytic converter.

20 Four different oxides are listed.

1 calcium oxide

2 lithium oxide

3 nitrogen oxide

4 phosphorus oxide

Which oxides are acidic oxides?

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

21 Substance X is mixed with aqueous sodium hydroxide.

A green precipitate is produced.

Which metal ion is present in X?

A Cu^{2+} **B** Fe^{2+} **C** Fe^{3+} **D** Zn^{2+}

22 Potassium is in Group I of the Periodic Table.

Which statement about potassium is correct?

A It is a relatively hard metal.

B It is less dense than lithium.

C It has a higher melting point than sodium.

D It reacts more vigorously with water than sodium.

23 What is a use for argon?

A as a catalyst

B in alloys

C in lamps

D neutralising chemical waste

24 Which metal is extracted from its ore by electrolysis?

A aluminium

B copper

C gold

D iron

25 Which gas is present in clean air?

A carbon dioxide

B carbon monoxide

C nitrogen dioxide

D sulfur dioxide

26 Which statement about petroleum is correct?

A It contains mostly alkene molecules.

B It is a mixture of hydrocarbons.

C It is separated into fractions by cracking.

D Its main constituent is methane.

27 Which statement about poly(ethene) is correct?

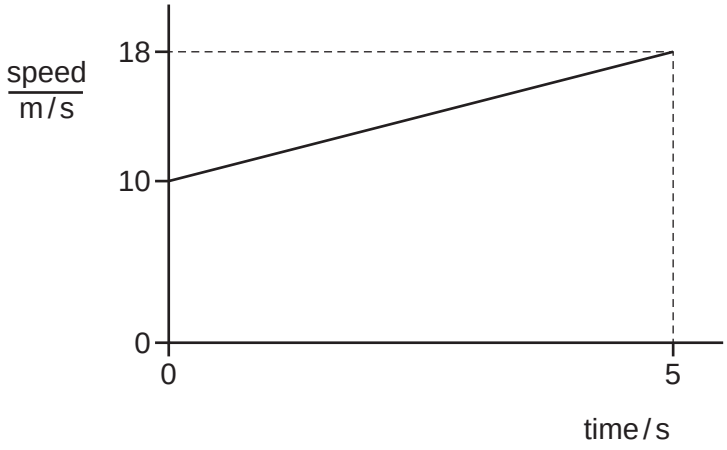
A It always contains less than 12 carbon atoms.

B It is formed from ethane.

C It is formed from ethene.

D It occurs naturally.

28 The speed–time graph represents part of a car journey.



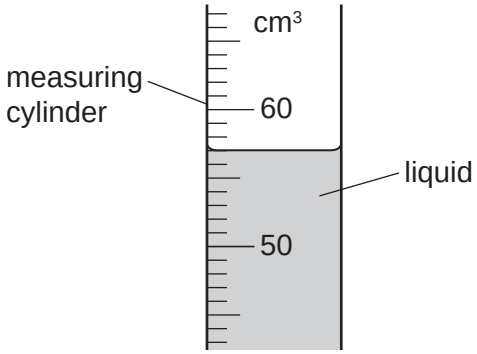
How far does the car travel in the part of the journey shown?

A 20 m **B** 45 m **C** 70 m **D** 90 m

29 The mass of an empty measuring cylinder is 15 g.

Liquid is poured into it and the total mass is now 95 g.

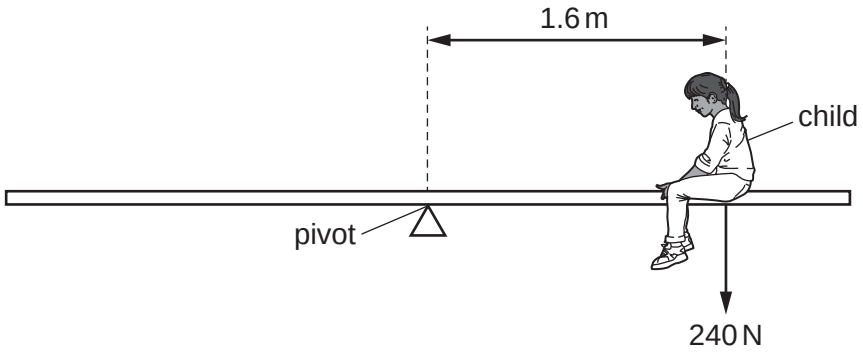
The reading on the measuring cylinder is shown.



What is the density of the liquid?

A 1.3 g / cm^3 **B** 1.4 g / cm^3 **C** 1.5 g / cm^3 **D** 1.7 g / cm^3

30 The diagram shows a child of weight 240 N sitting on a see-saw (teeter-totter) at a distance of 1.6 m from the pivot.



What is the moment of the weight of the child about the pivot, with the correct unit?

A 150 N m **B** 150 N / m **C** 384 N m **D** 384 N / m

31 Which two energy sources are both non-renewable?

A oil and geothermal resources

B oil and natural gas

C tides and geothermal resources

D tides and wind

32 Someone wearing wet clothes can feel cold even on a warm day.

Why do they feel cold?

A Water gives out heat as it evaporates.

B Water takes in heat as it evaporates.

C Water vapour gives out heat as it condenses.

D Water vapour takes in heat as it condenses.

33 How is thermal energy transferred from the Sun through the vacuum of space?

A by conduction and convection

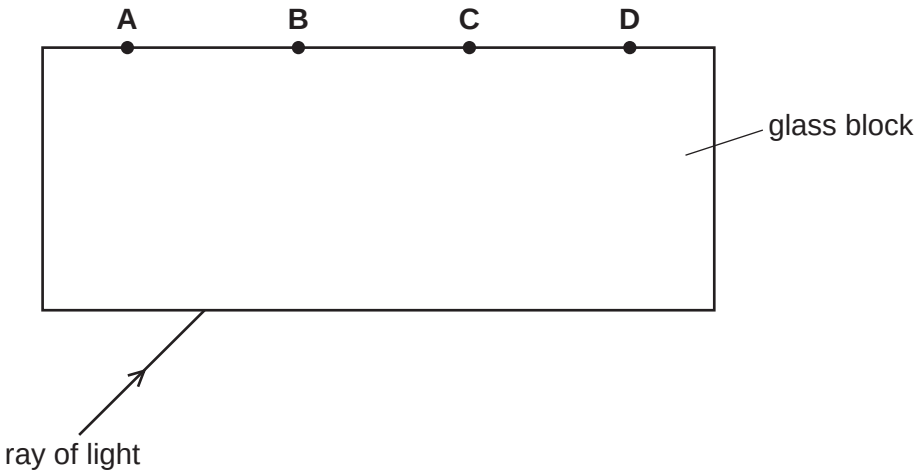
B by convection and radiation

C by convection only

D by radiation only

34 A ray of light enters a parallel-sided glass block.

At which labelled point does the ray leave the block?



35 Which change to a sound wave makes the sound louder?

A decreasing the amplitude

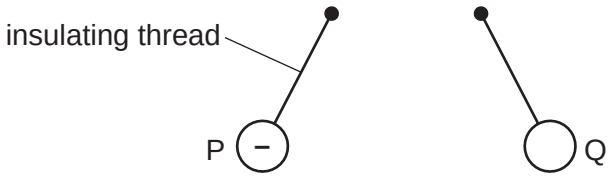
B decreasing the wavelength

C increasing the amplitude

D increasing the wavelength

36 Three charged balls P, Q and R are suspended by insulating threads. Ball P is negatively charged.

Ball Q is brought close to ball P. The balls move away from each other.



Ball Q is now brought close to ball R. The balls move closer to each other.

What are the signs of the charges on ball Q and ball R?

	ball Q	ball R
A	negative	negative
B	negative	positive
C	positive	negative
D	positive	positive

37 Which two electrical quantities are measured in the same unit?

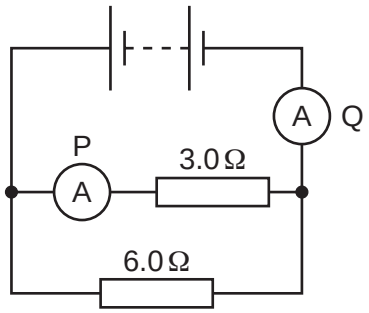
A current and potential difference (p.d.)

B current and electromotive force (e.m.f.)

C potential difference (p.d.) and electromotive force (e.m.f.)

D potential difference (p.d.) and resistance

38 A battery is connected in a circuit to a 3.0 Ω resistor, a 6.0 Ω resistor and two ammeters P and Q.



What is the combined resistance of the two resistors and which ammeter has the greater reading?

	combined resistance / Ω	ammeter with greater reading
A	less than 3.0	P
B	less than 3.0	Q
C	9.0	P
D	9.0	Q

39 The current in an electric kettle used to boil water is 9.0 A.

What is the most appropriate rating of fuse to use with this kettle?

A 1 A **B** 3 A **C** 8 A **D** 13 A

40 A nuclide of hydrogen is represented by $^{3}_{1}H$.

Which row shows the number of protons and the number of neutrons in this nuclide?

	protons	neutrons
A	1	2
B	1	3
C	2	1
D	3	1

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The Periodic Table of Elements

Group																	
I	II											III	IV	V	VI	VII	VIII
							1 H hydrogen 1										2 He helium 4
3 Li lithium 7	4 Be beryllium 9											5 B boron 11	6 C carbon 12	7 N nitrogen 14	8 O oxygen 16	9 F fluorine 19	10 Ne neon 20
11 Na sodium 23	12 Mg magnesium 24											13 Al aluminium 27	14 Si silicon 28	15 P phosphorus 31	16 S sulfur 32	17 Cl chlorine 35.5	18 Ar argon 40
19 K potassium 39	20 Ca calcium 40	21 Sc scandium 45	22 Ti titanium 48	23 V vanadium 51	24 Cr chromium 52	25 Mn manganese 55	26 Fe iron 56	27 Co cobalt 59	28 Ni nickel 59	29 Cu copper 64	30 Zn zinc 65	31 Ga gallium 70	32 Ge germanium 73	33 As arsenic 75	34 Se selenium 79	35 Br bromine 80	36 Kr krypton 84
37 Rb rubidium 85	38 Sr strontium 88	39 Y yttrium 89	40 Zr zirconium 91	41 Nb niobium 93	42 Mo molybdenum 96	43 Tc technetium –	44 Ru ruthenium 101	45 Rh rhodium 103	46 Pd palladium 106	47 Ag silver 108	48 Cd cadmium 112	49 In indium 115	50 Sn tin 119	51 Sb antimony 122	52 Te tellurium 128	53 I iodine 127	54 Xe xenon 131
55 Cs caesium 133	56 Ba barium 137	57–71 lanthanoids	72 Hf hafnium 178	73 Ta tantalum 181	74 W tungsten 184	75 Re rhenium 186	76 Os osmium 190	77 Ir iridium 192	78 Pt platinum 195	79 Au gold 197	80 Hg mercury 201	81 Tl thallium 204	82 Pb lead 207	83 Bi bismuth 209	84 Po polonium –	85 At astatine –	86 Rn radon –
87 Fr francium –	88 Ra radium –	89–103 actinoids	104 Rf rutherfordium –	105 Db dubnium –	106 Sg seaborgium –	107 Bh bohrium –	108 Hs hassium –	109 Mt meitnerium –	110 Ds darmstadtium –	111 Rg roentgenium –	112 Cn copernicium –	113 Nh nihonium –	114 Fl flerovium –	115 Mc moscovium –	116 Lv livermorium –	117 Ts tennessine –	118 Og oganesson –

Key

atomic number
atomic symbol
name
relative atomic mass

lanthanoids	57 La lanthanum 139	58 Ce cerium 140	59 Pr praseodymium 141	60 Nd neodymium 144	61 Pm promethium –	62 Sm samarium 150	63 Eu europium 152	64 Gd gadolinium 157	65 Tb terbium 159	66 Dy dysprosium 163	67 Ho holmium 165	68 Er erbium 167	69 Tm thulium 169	70 Yb ytterbium 173	71 Lu lutetium 175
actinoids	89 Ac actinium –	90 Th thorium 232	91 Pa protactinium 231	92 U uranium 238	93 Np neptunium –	94 Pu plutonium –	95 Am americium –	96 Cm curium –	97 Bk berkelium –	98 Cf californium –	99 Es einsteinium –	100 Fm fermium –	101 Md mendelevium –	102 No nobelium –	103 Lr lawrencium –

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