Cambridge Assessment International Education

Cambridge IGCSE™

COMBINED SCIENCE **0653/13**

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 A student is playing a game of football.

Which characteristics of living organisms does the student show?

1 growth

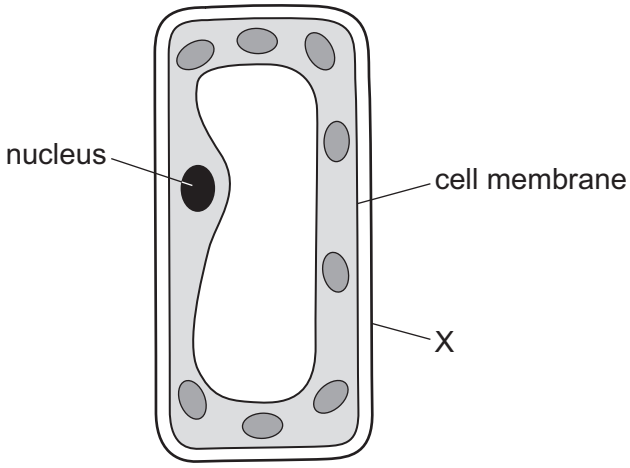
2 movement

3 respiration

4 sensitivity

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

2 The diagram shows a plant cell.



Which part of the cell is labelled X?

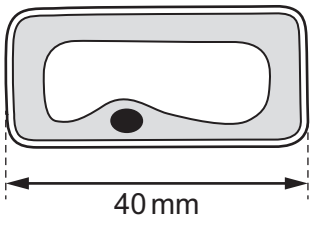
A cell wall

B chloroplast

C cytoplasm

D vacuole

3 The diagram shows a scale drawing of a cell.



The actual length of the cell is 0.002 mm.

What is the magnification of the cell?

A ×20 **B** ×200 **C** ×2000 **D** ×20 000

4 Which biological molecule is made from amino acids?

A fat

B protein

C starch

D sugar

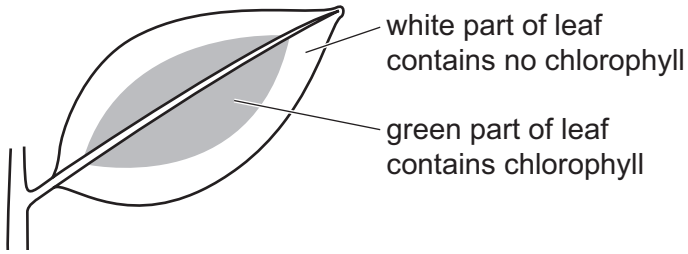
5 The table shows the time taken for an enzyme-controlled reaction to be completed at different temperatures.

temperature / °C	10	20	30	40	50
time taken for reaction to be completed / s	500	360	200	80	240

At which temperature does the enzyme work best?

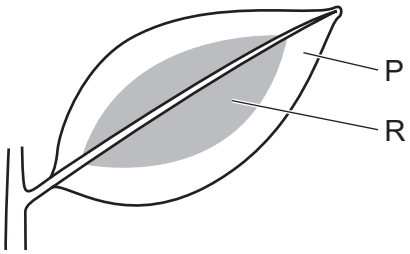
A 10 °C **B** 30 °C **C** 40 °C **D** 50 °C

6 A student investigates the need for chlorophyll in photosynthesis.

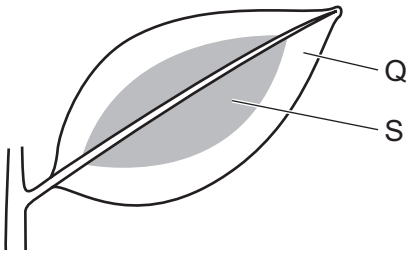


One leaf is placed in the dark and a second leaf is placed in the light for 48 hours.

leaf left in dark



leaf left in light

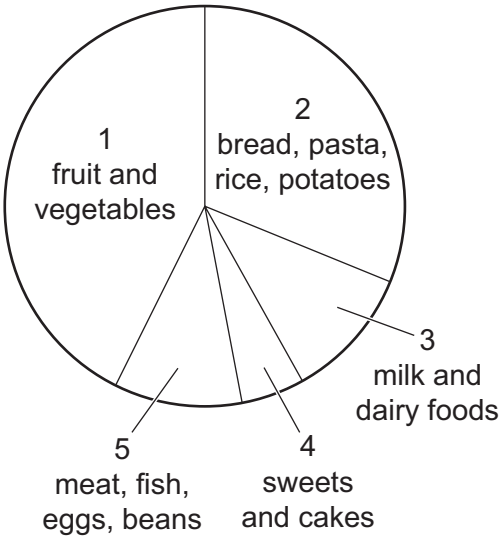


After 48 hours, the student tests the leaves for the presence of starch.

Which row shows the results?

	parts with starch present	parts with no starch present
A	P and Q	R and S
B	P, Q and R	S
C	R and S	P and Q
D	S	P, Q and R

7 The diagram shows suggested daily proportions of different dietary food groups.



Which food groups contain the highest amounts of carbohydrate?

A 1 and 3 **B** 1 and 5 **C** 2 and 4 **D** 3 and 5

8 In the alimentary canal, chemical digestion breaks down .....1..... , ...2..... molecules.

Which words complete gaps 1 and 2?

	1	2
A	large	insoluble
B	large	soluble
C	small	soluble
D	small	insoluble

9 What is transpiration?

A absorption of water by root hair cells

B loss of water vapour from leaves

C loss of water vapour from the roots of plants

D transport of sucrose in the phloem

10 What is the word equation for aerobic respiration?

A glucose → oxygen + water + carbon dioxide

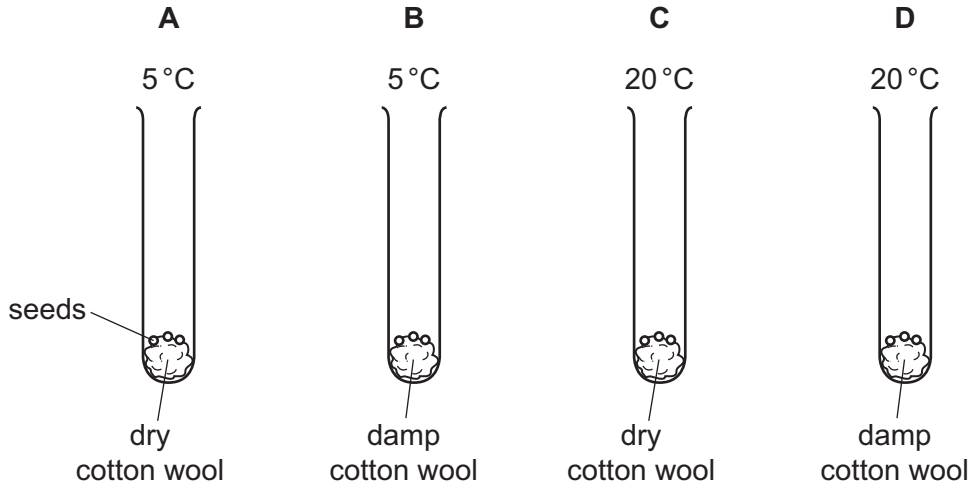
B glucose + carbon dioxide → oxygen + water

C glucose + oxygen → water + carbon dioxide

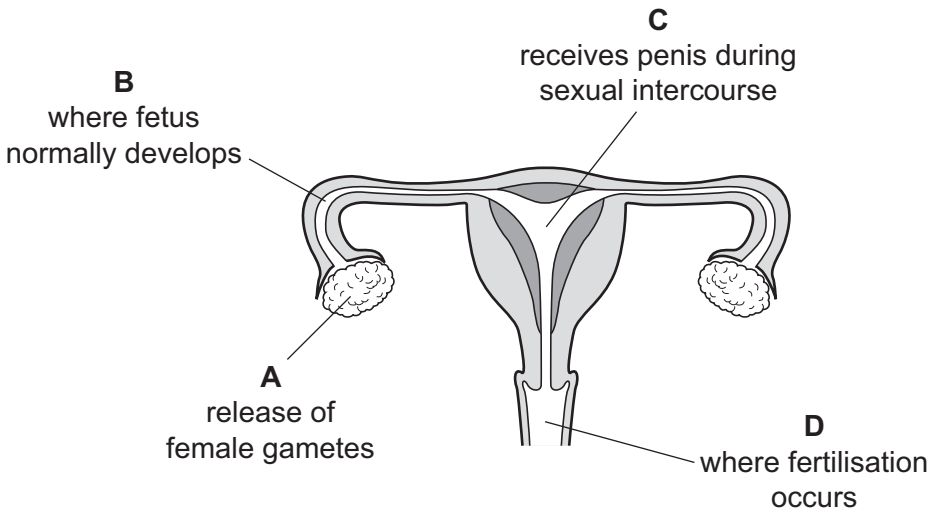
D glucose + water → oxygen + carbon dioxide

11 A student investigates the conditions needed for the germination of seeds.

Which seeds germinate first?



12 Which part of the female reproductive system shows the correct function?



13 An example of a food chain is shown.

grass → slug → frog → fox

Which terms describe the slug in this food chain?

1 carnivore

2 herbivore

3 primary consumer

4 secondary consumer

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

14 Element Y has a proton number of 18 and a nucleon number of 40.

Which statements about an atom of element Y are correct?

1 It has 40 neutrons in its nucleus.

2 It has 22 electrons.

3 It is unreactive.

4 It is in Group VIII of the Periodic Table.

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

15 Which compound contains covalent bonds?

A LiI **B** HC*l* **C** KC*l* **D** NaBr

16 The initial and the final temperatures of four different reactions are recorded.

Which reaction is the **most** exothermic?

	initial temperature / °C	final temperature / °C
A	19	16
B	20	19
C	22	24
D	24	25

17 Calcium carbonate and dilute hydrochloric acid start to react. Water is then added to the reaction mixture.

What happens to the rate of the reaction when the water is added?

A decreases

B increases

C stays the same

D stops

18 Which metal in Group I of the Periodic Table has the highest melting point?

A lithium

B sodium

C potassium

D rubidium

19 Element Q is in Group VII of the Periodic Table.

The melting point and boiling point of element Q are shown.

melting point / °C	–7.2
boiling point / °C	58.8

What is element Q?

A bromine

B chlorine

C fluorine

D iodine

20 Brass is made from copper and zinc.

Which row describes the type of substance and the electrical conductivity of brass?

	type of substance	electrical conductivity
A	mixture	poor
B	mixture	good
C	compound	poor
D	compound	good

21 Which two substances form when magnesium reacts with steam?

A magnesium hydroxide and hydrogen

B magnesium hydroxide and oxygen

C magnesium oxide and hydrogen

D magnesium oxide and water

22 Anhydrous copper(II) sulfate is used to test for water.

Which colour does it turn in the presence of water?

A white

B pink

C green

D blue

23 Which statement about air is correct?

A Air is a mixture of elements and compounds.

B Carbon monoxide in the air is a particulate.

C Clean, dry air consists of 78% oxygen.

D Nitrogen in the air causes iron to rust.

24 Which gas forms during the complete combustion of methane?

A carbon monoxide

B carbon dioxide

C hydrogen

D oxygen

25 What is petroleum?

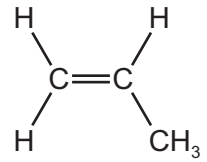
A an alkene

B a mixture of hydrocarbons

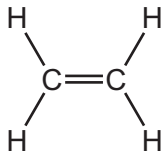
C an ionic compound

D the main constituent of natural gas

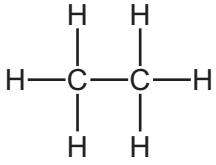
26 The structures of molecules W, X, Y and Z are shown.



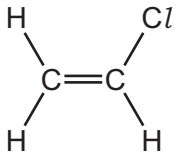
W



X



Y



Z

Which molecules are unsaturated hydrocarbons?

A W, X and Y **B** W, X and Z **C** W and X only **D** Y and Z only

27 Aqueous ammonia is added to a solution containing a salt.

A white precipitate is produced which dissolves in excess aqueous ammonia.

Which ion is present in the salt?

A ammonium

B iron(II)

C iron(III)

D zinc

28 An empty measuring cylinder has a mass of 180 g.

A volume of 65 cm^3 of a liquid is added to the measuring cylinder.

The total mass of the cylinder and the liquid is 240 g.

What is the density of the liquid?

A 0.92 g/cm^3 **B** 1.1 g/cm^3 **C** 2.8 g/cm^3 **D** 3.7 g/cm^3

29 A ball is thrown vertically upwards with a kinetic energy of 60 J.

Ignore air resistance.

Which row describes the energy changes that occur as the ball moves up to its highest point?

	kinetic energy	gravitational potential energy
A	decreases by 60 J	increases by 60 J
B	decreases by 60 J	increases by 120 J
C	increases by 60 J	decreases by 60 J
D	increases by 60 J	decreases by 120 J

30 A student stands on the ground on two feet. The student's feet are identical in size.

The student exerts pressure *P* on the ground.

The student now lifts one foot off the ground.

What is the pressure now exerted on the ground?

A $\frac{P}{4}$ **B** $\frac{P}{2}$ **C** P **D** $2P$

31 The particles of a substance are far apart and move in straight lines until they hit something.

The temperature of the substance is changed and this causes the particles to move more quickly.

Which row shows the state of the substance and the change in temperature?

	state of substance	change in temperature
A	gas	decrease
B	gas	increase
C	solid	decrease
D	solid	increase

32 Convection is a process by which thermal energy is transferred from one place to another.

Which statement describes where convection takes place?

A in a gas and in a vacuum

B in a liquid and in a gas

C in a liquid and in a solid

D in a solid and in a vacuum

33 A metal container is filled with water and placed in direct sunlight.

The outside surfaces of the container are painted.

Which type of paint results in the smallest rate of increase in temperature of the water?

A dull black

B dull white

C shiny black

D shiny white

34 A water wave travels across the surface of a pond. The highest point on the wave is the crest (peak).

What is the frequency of the water wave?

A the distance between two neighbouring crests

B the height of a crest above the surface of the pond

C the number of crests passing a fixed point every second

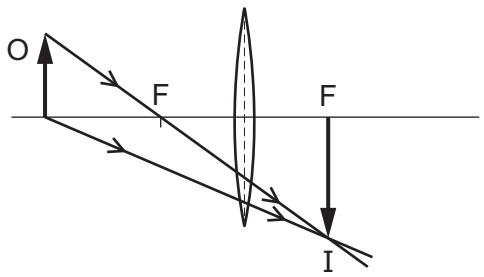
D the speed at which the crests move across the surface of the pond

35 A thin converging lens has focal length F.

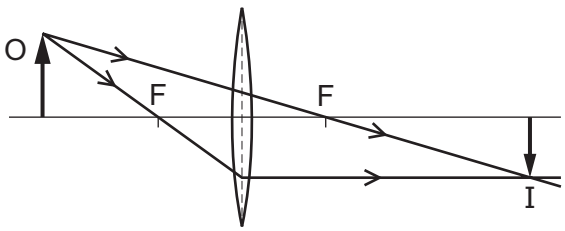
Object O is placed near the lens. The lens produces image I of the object.

Which diagram shows how image I is formed by the lens?

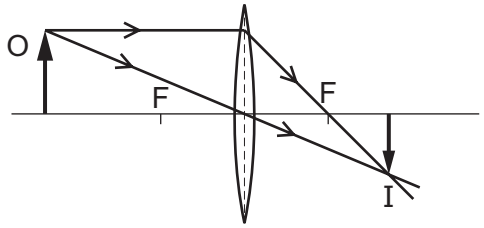
A



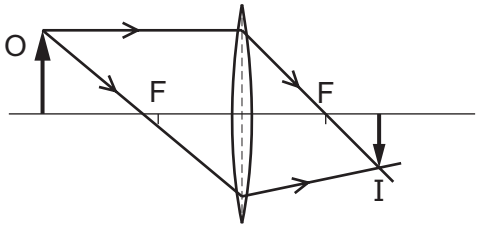
B



C



D



36 Infrared, microwaves, ultraviolet and visible light are all regions of the electromagnetic spectrum.

Which region has waves with the smallest wavelength?

A infrared

B microwaves

C ultraviolet

D visible light

37 There is a current of 4.0 A in resistor R.

The voltage across the resistor is 2.0 V.

What is the resistance of resistor R?

A 0.50 Ω **B** 2.0 Ω **C** 6.0 Ω **D** 8.0 Ω

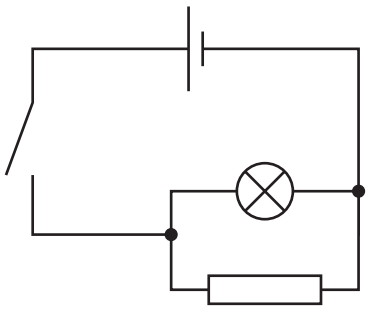
38 A lamp is labelled 12.0 V, 15.0 mA.

What is the power of the lamp when it is working normally?

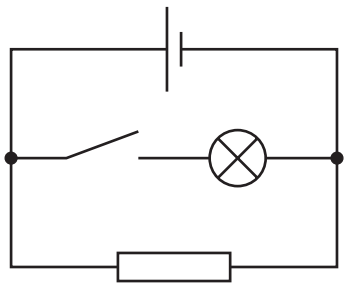
A 0.00125 W **B** 0.180 W **C** 0.800 W **D** 1.25 W

39 In which circuit does operating the switch **not** affect the lamp?

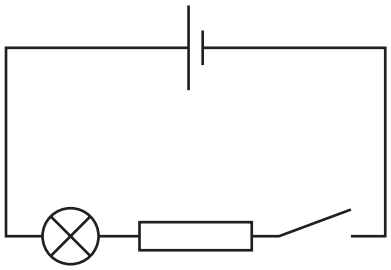
A



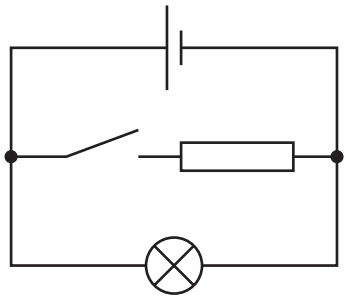
B



C



D



40 What is the approximate diameter of the Milky Way?

A 10 000 light-years

B 100 000 light-years

C 1 000 000 light-years

D 10 000 000 light-years

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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.).