Cambridge Assessment International Education

Cambridge IGCSE™

COMBINED SCIENCE **0653/11**

Paper 1 Multiple Choice (Core) **October/November 2024**

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.

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1 Chemical reactions in a muscle cell release energy by breaking down nutrient molecules.

Which characteristic of living things is this an example of?

A excretion

B growth

C nutrition

D respiration

2 Which row is correct?

	starch	proteins	fats
A	made from amino acids	made from glucose	made from glycerol
B	made from amino acids	made from glucose	made from fatty acids and glycerol
C	made from glucose	made from amino acids	made from fatty acids and glycerol
D	made from glucose	made from glycerol	made from amino acids

3 Which name is given to proteins that function as biological catalysts in cells?

A antibodies

B enzymes

C haemoglobin

D hormones

4 The list shows some chemicals that are important to a plant.

1 carbon dioxide

2 nitrates

3 oxygen

4 water

Which chemicals does a plant use in photosynthesis?

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

5 What are the functions of the small intestine?

A absorption and digestion

B absorption and egestion

C ingestion and digestion

D ingestion and egestion

6 The table shows some of the processes involved in transpiration.

What happens to these processes when the temperature increases?

	evaporation of water from the surface of mesophyll cells	diffusion of water vapour through stomata
A	decreases	decreases
B	decreases	increases
C	increases	decreases
D	increases	increases

7 Which component of blood is used for clotting?

A plasma

B platelets

C red blood cells

D white blood cells

8 What is the correct equation for aerobic respiration?

A carbon dioxide + oxygen → glucose + water

B carbon dioxide + water → glucose + oxygen

C glucose + oxygen → carbon dioxide + water

D glucose + water → carbon dioxide + oxygen

9 What is the effect of adrenaline on the rate of breathing and pulse rate?

	rate of breathing	pulse rate
A	decreases	decreases
B	decreases	increases
C	increases	decreases
D	increases	increases

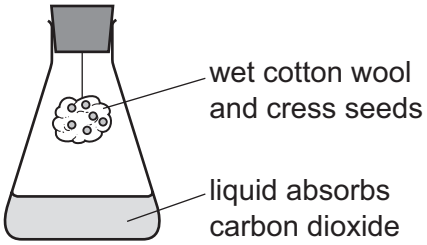
[Turn over

10 Which row is correct for sexual reproduction?

	a zygote is formed	the offspring are genetically identical to each other
A	✓	✓
B	✓	✗
C	✗	✓
D	✗	✗

11 In which flask do the cress seeds germinate first?

A



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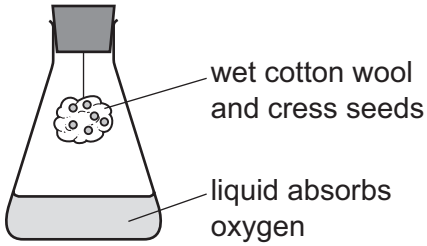

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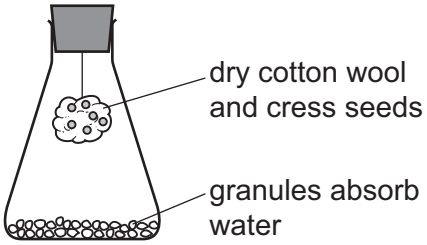

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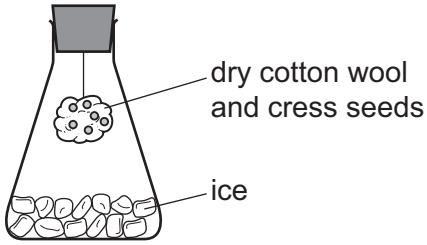
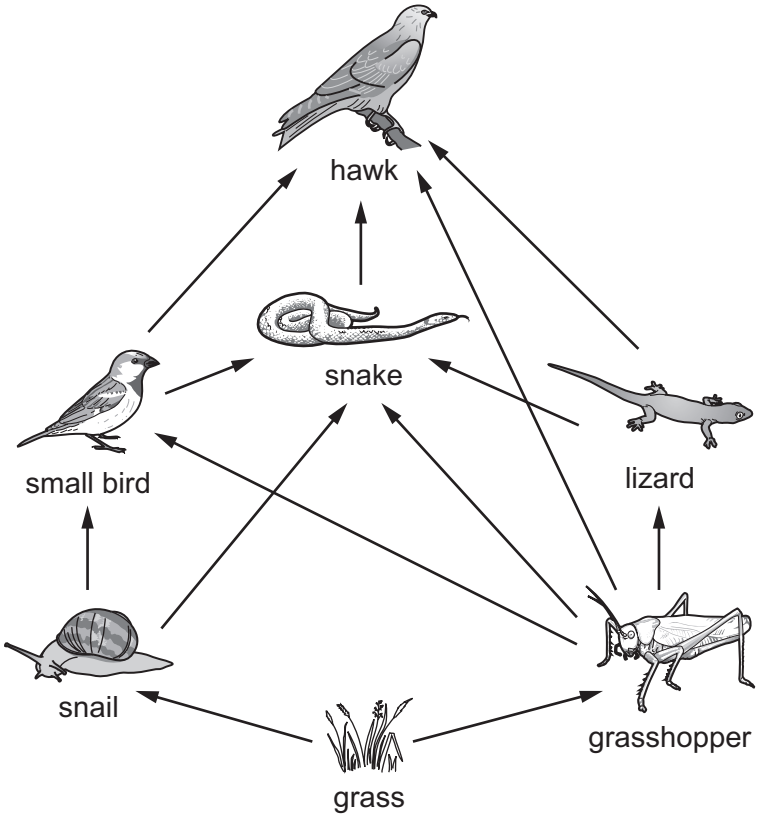


12 The diagram shows a food web.



Which statement about the snake is correct?

A It is a consumer and it is a carnivore.

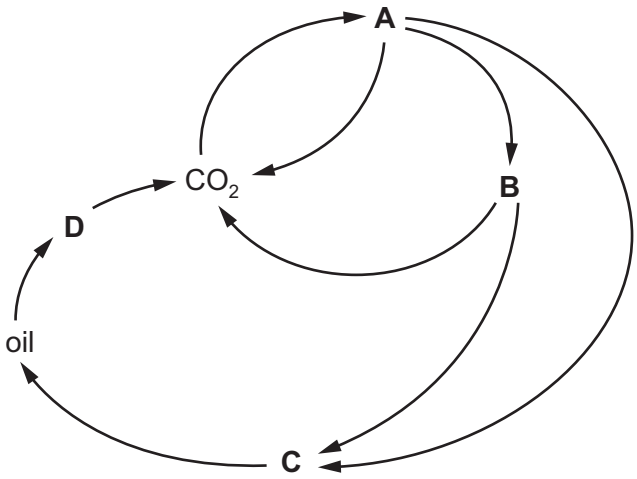
B It is a producer and it is a carnivore.

C It is a consumer and it is a herbivore.

D It is a producer and it is a herbivore.

13 The diagram represents the carbon cycle.

Which letter represents combustion?



14 Four processes are listed.

1 melting of ice

2 electrolysis of molten lead(II) bromide

3 combustion of carbon

4 rusting of iron

Which processes are chemical changes?

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

15 Aluminium sulfate contains two aluminium atoms, three sulfur atoms and twelve oxygen atoms.

What is the formula of aluminium sulfate?

A $2Al_3S_6O$ **B** $2AlS_3O_{12}$ **C** $Al_2(SO_4)_3$ **D** $Al_23(SO_4)$

16 In which states do ionic compounds undergo electrolysis?

A aqueous and solid

B aqueous and liquid

C gas and solid

D gas and liquid

17 Which type of reaction always releases thermal energy into the surroundings?

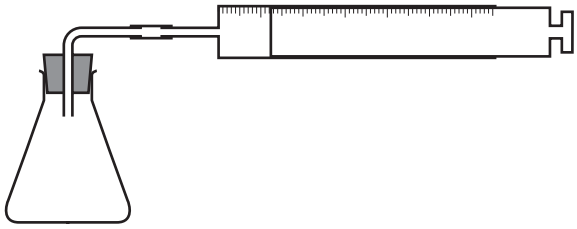
A endothermic

B evaporation

C exothermic

D redox

18 The apparatus used to measure the volume of gas produced in the reaction between magnesium and dilute hydrochloric acid is shown.



Which other piece of apparatus is required to determine the rate of gas production in this experiment?

A balance

B measuring cylinder

C pipette

D stop-watch

19 Copper oxide reacts with hydrogen to form copper and water.

The equation for this reaction is shown.

$$CuO + H_2 \rightarrow Cu + H_2O$$

Which substance is reduced in this reaction?

A Cu **B** CuO **C** H_2 **D** H_2O

20 Lithium is added to water containing universal indicator.

A gas is given off and the indicator changes colour.

Which row describes the gas produced and the final colour of the indicator?

	gas produced	final colour of the indicator
A	hydrogen	blue
B	hydrogen	red
C	oxygen	blue
D	oxygen	red

21 A solution of compound X produces a green precipitate when aqueous sodium hydroxide is added.

What is X?

A copper(II) chloride

B copper(II) sulfate

C iron(II) sulfate

D iron(III) chloride

22 Which statement about noble gases is correct?

A Atoms of noble gases form diatomic molecules.

B Atoms of noble gases have full outer shells of electrons.

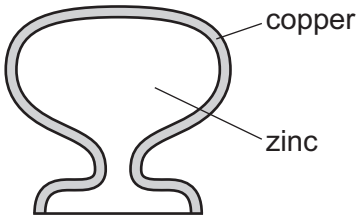
C They form unreactive compounds.

D They are good conductors of electricity.

23 Brass is an alloy of copper and zinc.

Which diagram represents a door handle made of brass?

A



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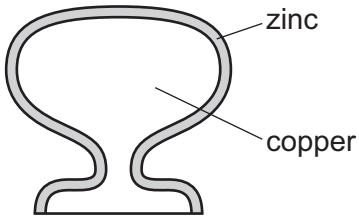

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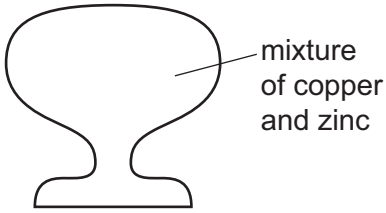

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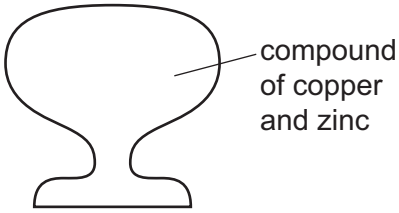


24 What is a chemical test for water?

A Blue cobalt(II) chloride paper turns pink.

B Measure its boiling point which is 100 °C.

C Measure its melting point which is 0 °C.

D Pink cobalt(II) chloride paper turns blue.

25 What is the approximate percentage of carbon dioxide in clean air?

A 0.04% **B** 2% **C** 20% **D** 80%

26 Petroleum is separated into fractions by fractional distillation.

Which row shows the correct use for the named fraction?

	fraction	use
A	bitumen	making road surfaces
B	gasoline	fuel for diesel engines
C	naphtha	fuel for cars
D	refinery gas	making other chemicals

27 Which statement about alkanes is correct?

A They contain double bonds.

B They react with acids.

C They react with aqueous bromine.

D They undergo complete combustion.

28 Which quantity is measured using a measuring cylinder?

A length

B mass

C time

D volume

29 How is the density of a sample of a liquid calculated?

A by adding the mass of the sample to its volume

B by dividing the mass of the sample by its volume

C by multiplying the mass of the sample by its volume

D by subtracting the mass of the sample from its volume

30 An object is travelling in a straight line at constant speed.

Which statement describes the resultant force on the object?

A It acts in the opposite direction to the motion of the object.

B It acts in the same direction as the motion of the object.

C It is constant, but not zero.

D It is zero.

31 How is energy transferred from the Sun to the Earth through the vacuum of space?

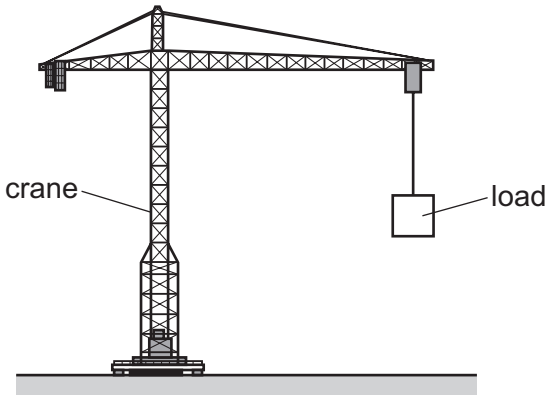
A by electromagnetic waves

B by movement of electrons

C by movement of molecules

D by sound waves

32 A crane lifts a load vertically.



Which situation requires the crane to produce a greater power?

A lifting a lighter load through the same distance in the same time

B lifting the same load through a smaller distance in the same time

C lifting the same load through the same distance in a longer time

D lifting the same load through the same distance in a shorter time

33 The more-energetic molecules of a liquid escape from its surface and the temperature of the remaining liquid decreases.

Which process is occurring?

A boiling

B condensation

C evaporation

D melting

34 An iron rod fits tightly inside an aluminium cylinder. To remove the rod from the cylinder, hot air is blown onto the rod and cylinder. After a short time, the rod slides out of the cylinder.

Why does this happen?

A The aluminium expands more than the iron.

B The aluminium is a better thermal insulator than the iron.

C The iron expands more than the aluminium.

D The iron is a better thermal conductor than the aluminium.

35 A gas is trapped in a container. The gas is heated from below.

What is the main method of thermal energy transfer in the gas?

A conduction

B convection

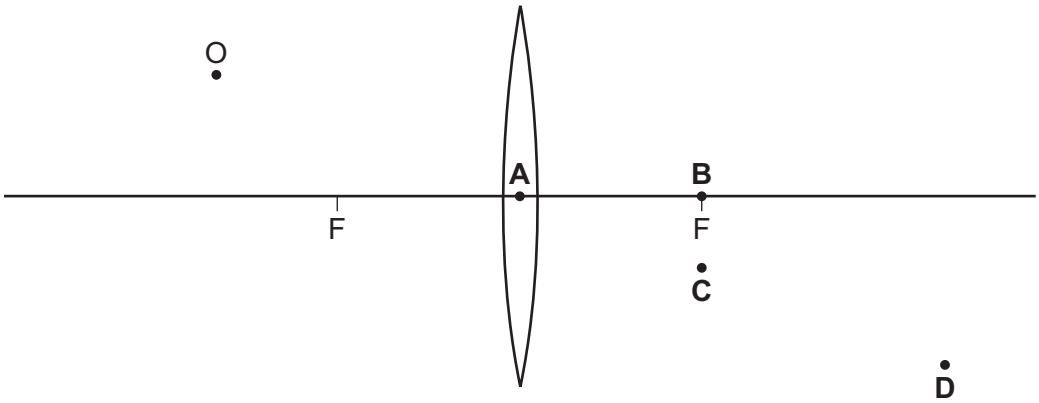
C evaporation

D radiation

36 The diagram shows a thin converging lens and a small object O.

Each principal focus is marked F.

Which labelled point is the position of the image of O?



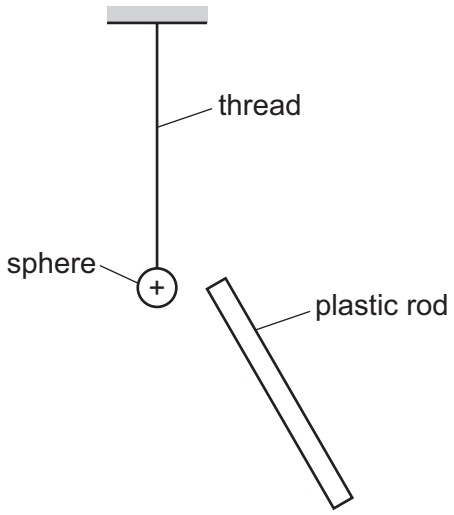
37 Elephants can hear sounds with frequencies between 10 Hz and 12 kHz.

Which frequency of sound can be heard by both elephants and humans with healthy ears?

A 10 Hz **B** 15 Hz **C** 1500 Hz **D** 15 000 Hz

38 A positively charged sphere is suspended from an insulating thread.

A plastic rod is rubbed with a cloth and moved towards the sphere.



The sphere moves away from the rod.

Why does this happen?

A Electrons have been added to the rod.

B Electrons have been removed from the rod.

C Protons have been added to the rod.

D Protons have been removed from the rod.

39 What is the unit of electromotive force (e.m.f.)?

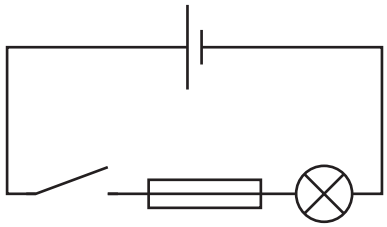
A ampere

B newton

C volt

D watt

40 The diagram shows a circuit.



What is a description of this circuit?

A a lamp that can be switched on and off, protected by a fuse

B a lamp that can have its brightness continuously varied

C a motor that can be switched on and off, protected by a fuse

D a motor that can have the current in it measured

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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.).