Cambridge Assessment International Education

Cambridge IGCSE™

CO-ORDINATED SCIENCES **0654/13**

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.

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

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1 What is **not** a characteristic of all living organisms?

A excretion

B growth

C photosynthesis

D sensitivity

2 What is an example of diffusion?

A movement of blood through the capillaries

B movement of food from the mouth to the stomach

C movement of oxygen from alveoli to the blood

D movement of urine along the urethra

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

A blue

B blue-black

C orange

D purple

4 A mixture of starch and saliva was set up at four different temperatures. Each mixture was tested with iodine solution after 15 minutes and again after 30 minutes.

The results are shown in the table.

temperature / °C	colour with iodine solution	
	15 minutes	30 minutes
0	blue-black	blue-black
15	blue-black	brown
35	brown	brown
95	blue-black	blue-black

What do the results suggest?

A The enzyme in saliva is inactive at 95 °C.

B The enzyme in saliva is slow to work at 35 °C.

C The enzyme in saliva works equally well at 15 °C and 35 °C.

D The enzyme in saliva works faster at higher temperatures.

5 Which chemical element is present in chlorophyll?

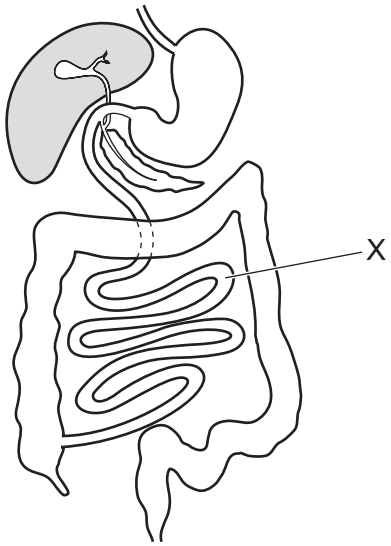
A calcium

B iron

C magnesium

D sodium

6 The diagram shows the human alimentary canal.



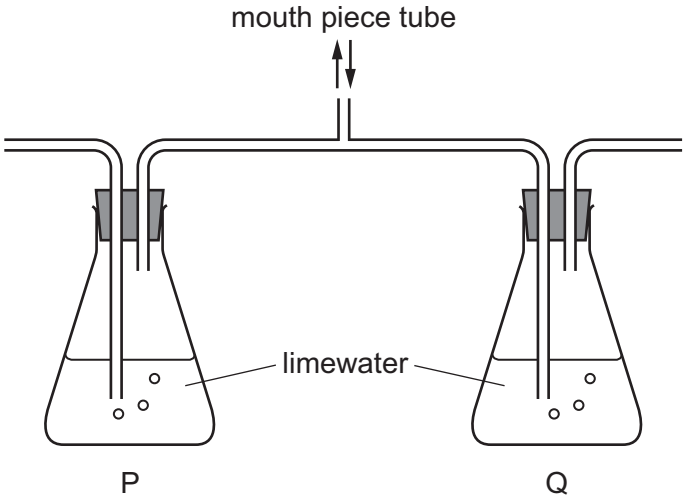
What is the name of organ X and which process occurs here?

	organ	process
A	large intestine	absorption
B	large intestine	egestion
C	small intestine	absorption
D	small intestine	egestion

7 Under which conditions will transpiration from a plant be fastest?

	temperature	humidity
A	high	high
B	high	low
C	low	high
D	low	low

8 A student breathed gently in and out of the mouth piece of the apparatus shown.



What were the results after 10 breaths?

	P	Q
A	clear	clear
B	clear	milky
C	milky	clear
D	milky	milky

9 A plant shoot grows towards a light source.

This is an example of what?

A gravitropism

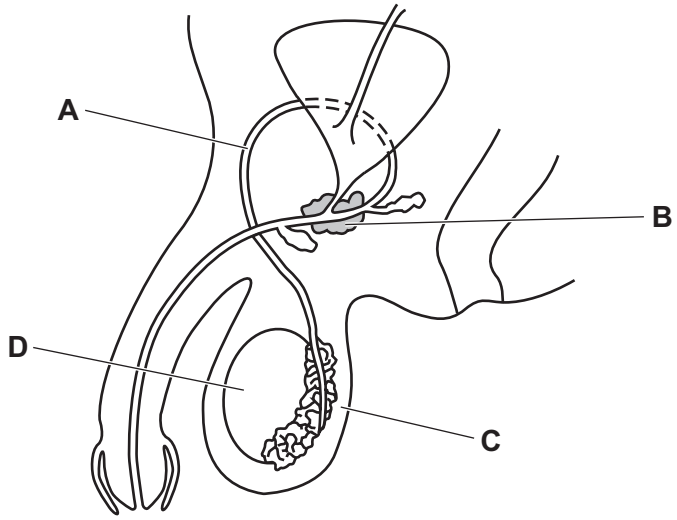
B homeostasis

C transpiration

D phototropism

10 The diagram shows the male reproductive system.

Which label is pointing to the structure where sperm are produced?



11 In humans, which combination of sex chromosomes from the ovum and sperm would result in a female?

	ovum	sperm
A	X	X
B	X	Y
C	Y	X
D	Y	Y

12 Which description of a producer is correct?

A an organism producing food by eating other creatures

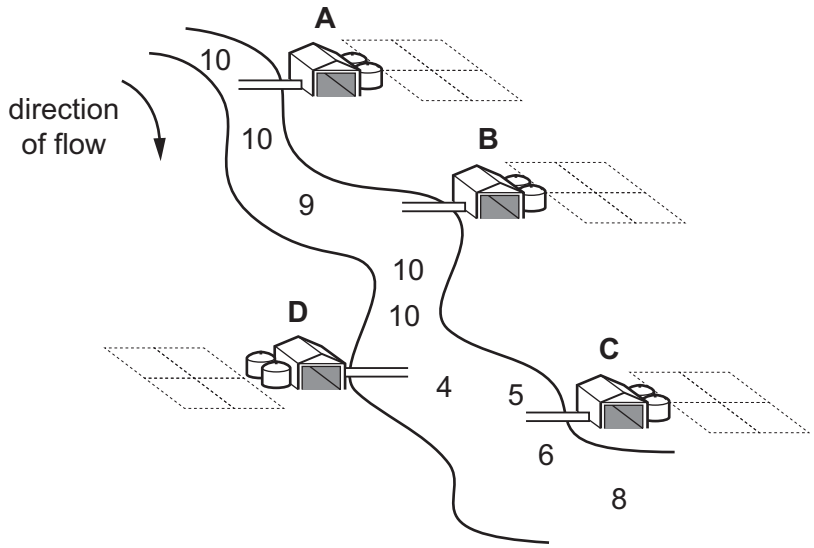
B an organism that gets its energy by eating plants

C an organism that gets its energy from dead or waste organic matter

D an organism that is able to make its own organic nutrients

13 The diagram shows a river and four farms. The numbers in the river show relative oxygen concentrations.

From which farm is untreated sewage leaking into the river?



14 Atoms are the smallest parts of ……1…… .

When atoms of the same type chemically join together, a ……2…… is formed.

When different types of atom chemically join together, they form ……3……. .

Which words complete gaps 1, 2 and 3?

	1	2	3
A	elements	molecule	compounds
B	elements	molecule	mixtures
C	molecules	compound	mixtures
D	molecules	mixture	compounds

15 Which piece of apparatus is used to measure exactly 15.7 cm^3 of a liquid?

A burette

B pipette

C 10 cm^3 measuring cylinder

D 20 cm^3 measuring cylinder

16 A mixture of solid sulfur and solid sodium chloride is added to water and stirred.

Sulfur is insoluble in water.

Sodium chloride is soluble in water.

Which processes are used to obtain pure sodium chloride from the mixture?

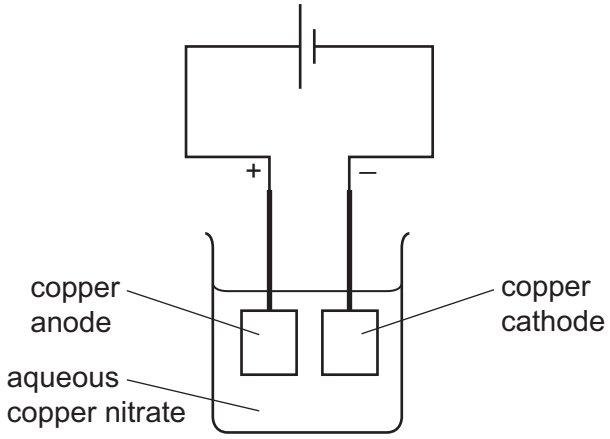
A distillation then chromatography

B distillation then crystallisation

C filtration then chromatography

D filtration then crystallisation

17 The diagram shows an electroplating experiment.



Which row shows the change in mass of each electrode?

	anode	cathode
A	decrease	decrease
B	decrease	increase
C	increase	decrease
D	increase	increase

18 The initial and final temperatures of four different experiments are measured.

Which experiment is the most endothermic?

	initial temperature / °C	final temperature / °C
A	20	19
B	20	27
C	21	26
D	22	20

19 Magnesium ribbon is reacted with 50 cm^3 of dilute hydrochloric acid.

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

A Increase the concentration of the hydrochloric acid.

B Increase the temperature of the hydrochloric acid.

C Increase the volume of the hydrochloric acid.

D Use powdered magnesium.

20 Which word equation represents a redox reaction?

A carbon + copper oxide → copper + carbon dioxide

B hydrochloric acid + potassium hydroxide → potassium chloride + water

C magnesium carbonate → magnesium oxide + carbon dioxide

D sodium sulfate + barium nitrate → barium sulfate + sodium nitrate

21 Salts are made by reacting dilute hydrochloric acid with four substances.

1 magnesium

2 magnesium carbonate

3 magnesium hydroxide

4 magnesium oxide

Which substances produce a gas when reacted with dilute hydrochloric acid?

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

22 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 I decreases down the group.

23 Which statement about the elements from chlorine to iodine in Group VII of the Periodic Table is correct?

A They are all gases at room temperature.

B Their boiling points decrease.

C Their colours become paler.

D Their reactivities decrease.

24 Why is chlorine used in the treatment of water supplies?

A to bleach water

B to kill bacteria

C to remove insoluble compounds

D to remove soluble compounds

25 Which process does **not** produce carbon dioxide?

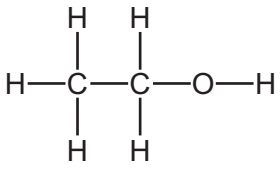
A acid reacting with a metal

B acid reacting with sodium carbonate

C complete combustion of methane

D respiration

26 The molecular structure of a compound is shown.



What is this type of compound?

A a hydroxide

B an alcohol

C an alkane

D an alkene

27 Poly(ethene) is made from ethene by the process of addition polymerisation.

Which word describes ethene in this process?

A fuel

B catalyst

C monomer

D solvent

28 Which row gives the unit for mass and the unit for weight?

	unit for mass	unit for weight
A	kg	kg
B	kg	N
C	N	kg
D	N	N

29 A solid object is made from a material with density $0.60\,g/cm^3$.

The volume of the object is $4.0\,cm^3$.

What is the mass of the object?

A 0.15 g **B** 2.4 g **C** 6.7 g **D** 38 g

30 Electricity is generated in power stations. Many power stations use steam to drive turbines.

Which type of power station does **not** use steam?

A chemical energy (fuel) power stations

B geothermal energy power stations

C hydroelectric energy power stations

D nuclear energy power stations

31 Ice is taken from a freezer. After some time the ice starts to melt.

What is the temperature of the ice as it melts?

A –10 °C **B** 0 °C **C** 20 °C **D** 100 °C

32 Which part of the electromagnetic spectrum is involved in thermal energy transfer by radiation?

A infrared

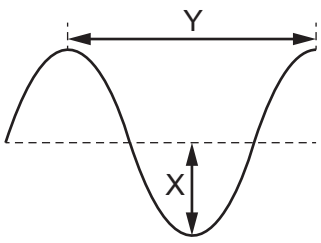
B radio

C ultraviolet

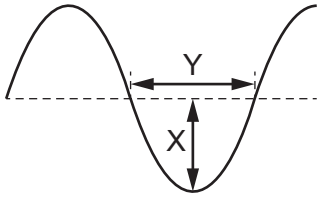
D X-rays

33 Which wave diagram shows the amplitude X and the wavelength Y of a wave?

A



B



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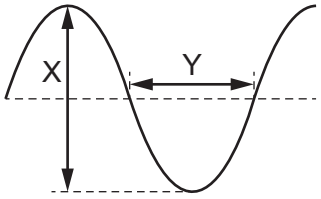
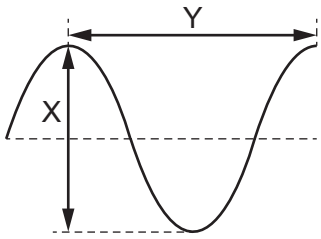
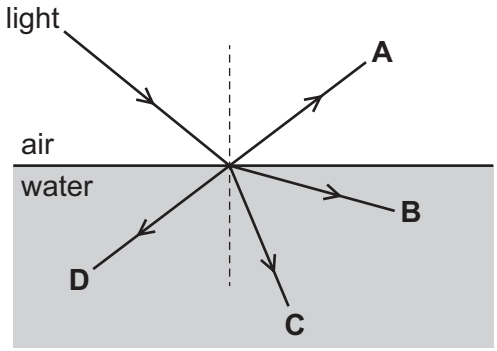


D



34 Light travelling in air strikes the surface of water and is refracted.

In which labelled direction is the light refracted?



35 A rod gains negative charge as it is rubbed with a cloth.

What happens to the cloth in this process?

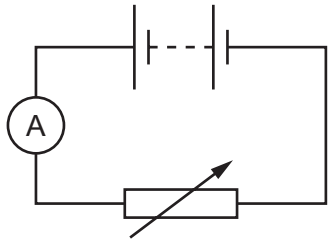
A It gains electrons.

B It loses electrons.

C It gains protons.

D It loses protons.

36 The diagram shows a circuit containing an ammeter and a variable resistor.

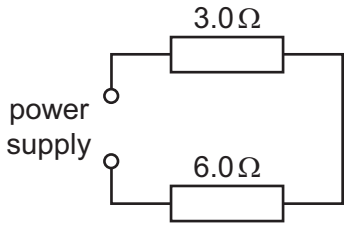


The resistance of the variable resistor is decreased.

What happens to the reading on the ammeter and what happens to the direction of the current in the ammeter?

	reading on ammeter	direction of current in ammeter
A	decreases	changes
B	decreases	stays the same
C	increases	changes
D	increases	stays the same

37 A 3.0 Ω resistor and a 6.0 Ω resistor are connected to a power supply as shown.



What is the combined resistance of the two resistors?

A 2.0 Ω **B** 4.5 Ω **C** 9.0 Ω **D** 18 Ω

38 Fuses are used in domestic electric circuits.

Which statement about fuses is correct?

A A fuse is connected in the live wire.

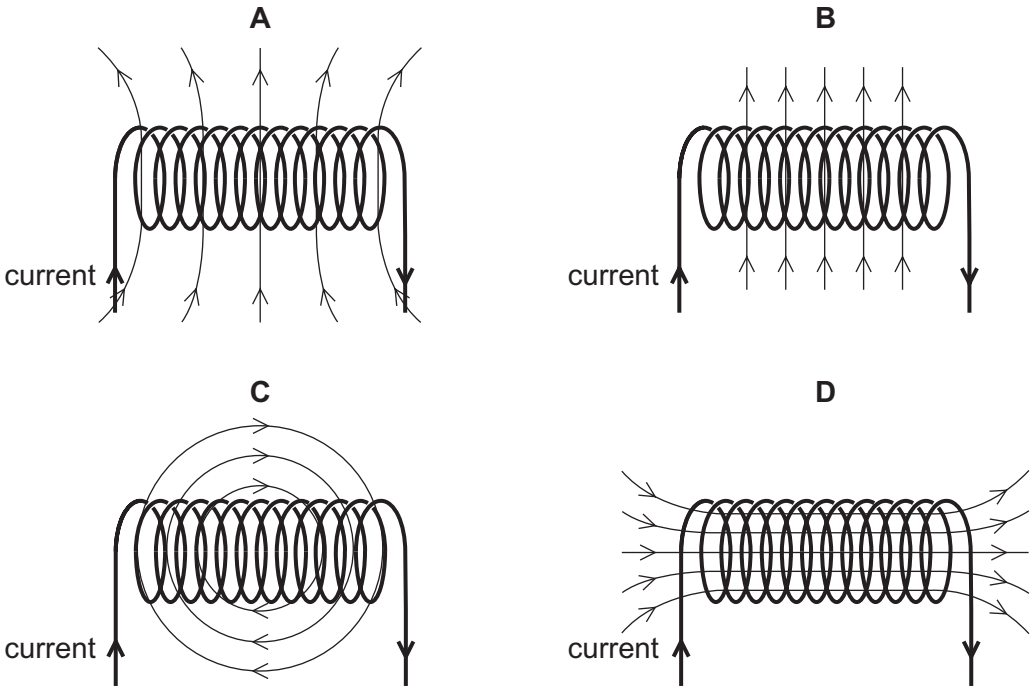
B A fuse is connected in the neutral wire.

C A 3 A fuse produces a current of exactly 3 A in the circuit.

D A 3 A fuse produces a minimum current of 3 A in the circuit.

39 A solenoid carrying a current produces a magnetic field.

Which diagram shows the magnetic field pattern?



40 Which type of radiation has the greatest ionising effect?

A infrared rays

B α-particles

C β-particles

D γ-rays

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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 –		114 Fl flerovium –		116 Lv livermorium –		

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.).