



Cambridge IGCSE™

COMBINED SCIENCE

0653/11

Paper 1 Multiple Choice (Core)

May/June 2022

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 What is the outermost layer of an animal cell and a plant cell?

	animal cell	plant cell
A	cell membrane	cell membrane
B	cell membrane	cell wall
C	cell wall	cell membrane
D	cell wall	cell wall

2 Most cars burn fossil fuels to release energy for their movement.

Which characteristic of living organisms is similar to this?

- A** excretion
- B** growth
- C** nutrition
- D** respiration

3 The table shows the results of tests carried out on a food sample.

test carried out	final colour
Benedict's	orange
biuret	blue
ethanol emulsion	milky white
iodine	brown

What is present in the food sample?

- A** oil and protein
 - B** oil and reducing sugar
 - C** protein and starch
 - D** reducing sugar and starch
- 4 Which statement about enzymes is correct?
- A** Enzymes are biological catalysts.
 - B** Enzymes are made of glycerol.
 - C** Enzymes are not affected by changes in pH.
 - D** Enzymes are not affected by changes in temperature.

- 5 A plant that lives in water is exposed to sunlight. After a short period of time, bubbles of gas are given off from the plant.

Which gas do the bubbles contain, and which process produces this gas?

	gas	process
A	carbon dioxide	photosynthesis
B	carbon dioxide	respiration
C	oxygen	photosynthesis
D	oxygen	respiration

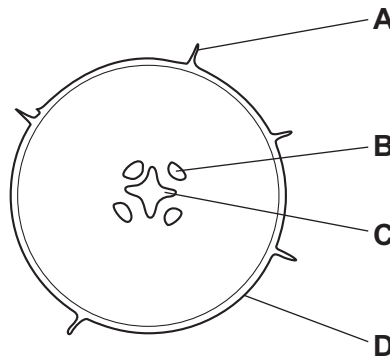
- 6 Which foods are rich in carbohydrate?

- 1 eggs
- 2 meat
- 3 potatoes
- 4 rice

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

- 7 The diagram shows a cross-section of a dicotyledonous root.

Which label correctly identifies the xylem?



- 8 Physical activity affects our rate and depth of breathing.

What happens during **increased** physical activity?

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

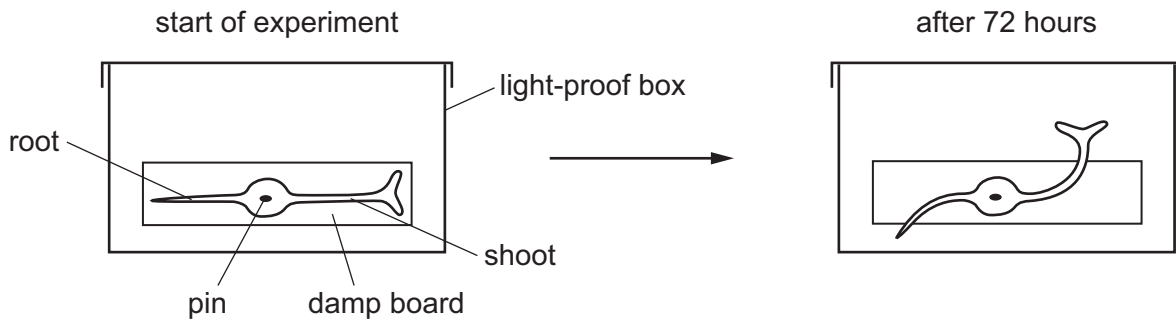
9 Which responses occur as a result of adrenaline secretion?

	increased breathing rate	decreased pupil diameter	increased pulse rate
A	✓	✗	✗
B	✓	✗	✓
C	✗	✓	✓
D	✗	✓	✗

key
 ✓ = does occur
 ✗ = does not occur

10 A plant seedling is pinned horizontally onto a damp board inside a light-proof box.

The diagrams show the seedling at the start of the experiment and after 72 hours.

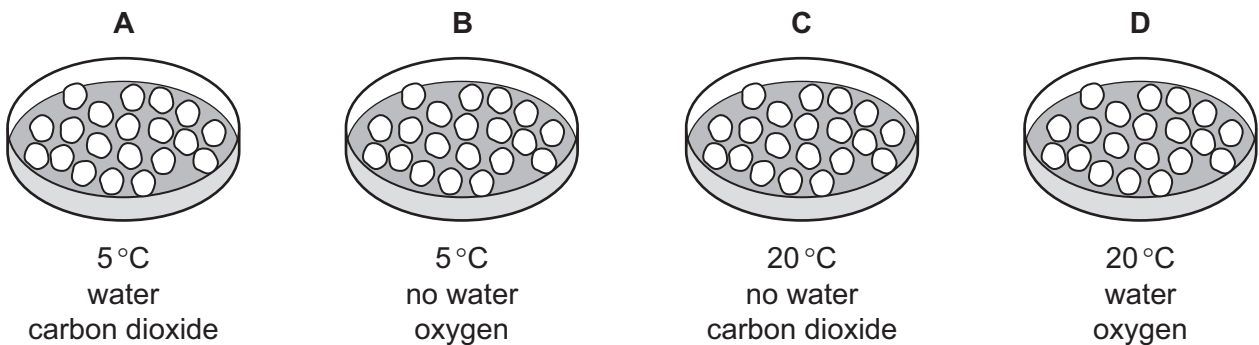


Which response is shown by the root and the shoot?

	root	shoot
A	gravitropism	gravitropism
B	gravitropism	phototropism
C	phototropism	gravitropism
D	phototropism	phototropism

11 A student investigates germination in bean seeds.

In which set of conditions will the seeds germinate?



12 Two food chains are shown.

wheat → vole → fox → tick

grass → rabbit → fox → flea

What are the vole and rabbit classified as in these food chains?

- A primary consumers
 - B producers
 - C secondary consumers
 - D tertiary consumers
- 13 Which process in the carbon cycle releases carbon into the environment?
- A feeding
 - B fossilisation
 - C photosynthesis
 - D respiration
- 14 What happens to water molecules when water freezes?
- A They become arranged more regularly.
 - B They become smaller.
 - C They move much closer together.
 - D They move faster.

15 Which row describes a chemical change?

	test	result
A	one end of a piece of aluminium is heated	the other end gets hot
B	calcium carbonate is heated	carbon dioxide is made
C	a piece of iron is heated	it becomes more malleable
D	a beaker of water is heated	steam is made

16 What describes a solvent?

- A a solid that dissolves in a liquid
- B the amount of solid that dissolves in a liquid
- C the liquid in which a solid dissolves
- D the mixture formed when a solid dissolves in a liquid

17 Which groups of the Periodic Table form compounds containing covalent bonds?

- A Group I and Group 0
- B Group I and Group VII
- C Group V and Group 0
- D Group V and Group VII

18 What is the chemical formula of nitric acid?

- A HCl B HNO₃ C H₂SO₄ D NH₃

19 Which type of substance undergoes electrolysis?

- A molten covalent compounds
- B solid ionic compounds
- C gaseous covalent compounds
- D aqueous solutions of ionic compounds

20 Which row shows what happens during an endothermic reaction?

	reaction mixture temperature	thermal energy transfer
A	decreases	from the surroundings
B	decreases	to the surroundings
C	increases	from the surroundings
D	increases	to the surroundings

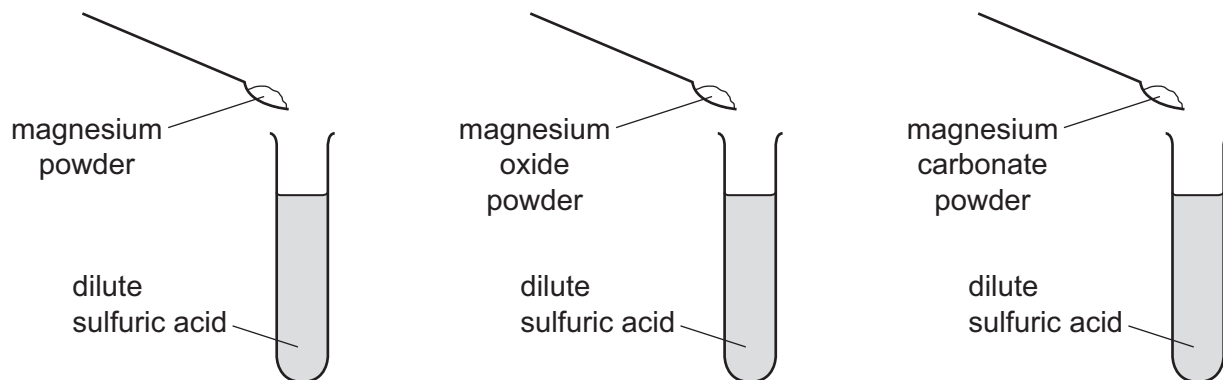
21 Carbon reacts with carbon dioxide at high temperatures.



Which statement about the reaction is correct?

- A Both carbon and carbon dioxide are oxidised.
- B Both carbon and carbon dioxide are reduced.
- C The carbon is oxidised and the carbon dioxide is reduced.
- D The carbon is reduced and the carbon dioxide is oxidised.

22 Three powders are added to dilute sulfuric acid, as shown.



Which powders react to produce water?

	magnesium	magnesium oxide	magnesium carbonate
A	✓	✓	✗
B	✓	✗	✗
C	✗	✓	✓
D	✗	✗	✓

key

✓ = does produce water

✗ = does not produce water

23 The results of two tests on substance Q are shown.

test	result
add dilute hydrochloric acid to solid Q	bubbles of colourless gas, R, which turns limewater milky
add aqueous sodium hydroxide to a solution of Q	green precipitate

Which cation is present in Q and what is gas R?

	cation present in Q	gas R
A	iron(II)	carbon dioxide
B	iron(II)	chlorine
C	iron(III)	carbon dioxide
D	iron(III)	chlorine

24 Which row describes a transition element?

	density	coloured compounds	acts as a catalyst
A	high	no	no
B	high	yes	yes
C	low	no	yes
D	low	yes	no

25 Which substance does **not** react with chlorine?

- A** H₂ **B** Kr **C** Li **D** NaBr

26 Which statement about a chemical test for water is correct?

- A** Anhydrous cobalt(II) chloride turns blue.
B Anhydrous cobalt(II) chloride turns white.
C Anhydrous copper(II) sulfate turns blue.
D Anhydrous copper(II) sulfate turns white.

27 Methane, ethane and propane are all alkanes. Their formulae are shown.

methane, CH₄

ethane, C₂H₆

propane, C₃H₈

Which statement is **not** correct?

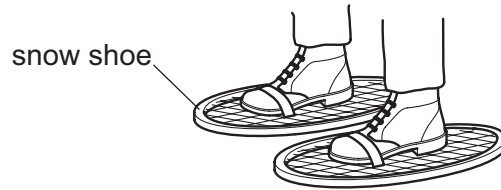
- A** All three compounds are hydrocarbons.
B All three compounds burn.
C Methane is the main constituent of natural gas.
D Propane burns completely to form carbon dioxide and hydrogen.

28 The mass of a solid object is 1.6 kg and the volume of the object is 80 cm³.

What is the density of the object?

- A** 0.020 kg/cm³
B 0.20 kg/cm³
C 5.0 kg/cm³
D 50 kg/cm³

- 29 Which statement about forces is always correct?
- A** A resultant force is needed to keep an object moving at constant speed in a straight line.
- B** Air resistance acting on an object falling in still air causes its speed to increase.
- C** Friction on an object sliding along rough ground acts in the opposite direction to its motion.
- D** No forces act on any object that is at rest.
- 30 A man walking on snow in normal shoes sinks into the snow. The man puts on snow shoes and does not sink into the snow.

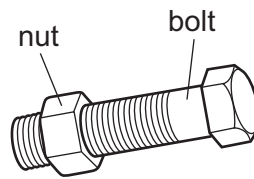


Which row explains why this happens?

	area of contact with snow	weight of man
A	decreased	decreased
B	decreased	unchanged
C	increased	decreased
D	increased	unchanged

- 31 Which two energy sources are both renewable?
- A** coal and waves
- B** geothermal and nuclear
- C** oil and tides
- D** wind and solar
- 32 Which process is the escape of more-energetic molecules from the surface of a liquid?
- A** condensation
- B** convection
- C** evaporation
- D** radiation

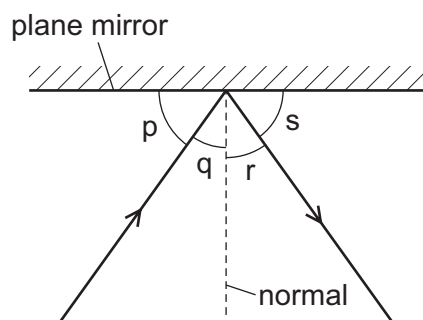
- 33 A mechanic cannot remove a large steel nut from a steel bolt because it is too tight.



What does the mechanic do to help remove the nut?

- A cool the nut and heat the bolt
 - B heat the bolt only
 - C heat the nut and the bolt through the same temperature rise
 - D heat the nut only
- 34 The diagram shows a ray of light being reflected from a plane mirror.

Four angles are labelled p, q, r and s.

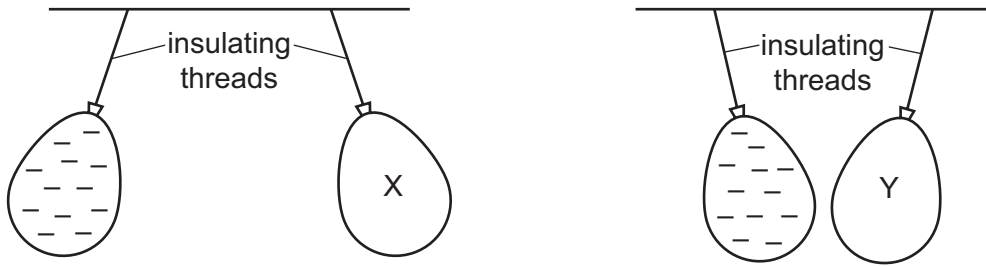


Which angles are the angle of incidence and the angle of reflection?

	angle of incidence	angle of reflection
A	p	r
B	p	s
C	q	r
D	q	s

- 35 Which region of the electromagnetic spectrum is used in remote controllers to control a television?
- A microwaves
 - B infrared
 - C ultraviolet
 - D visible light

- 36 Two balloons X and Y are suspended by insulating threads. They are each held near a negatively charged balloon. The balloons hang as shown.

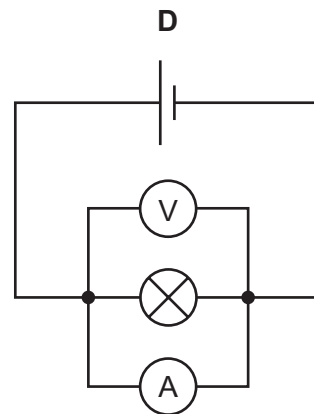
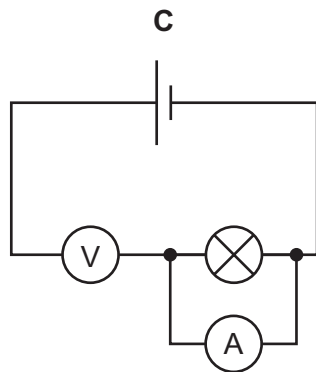
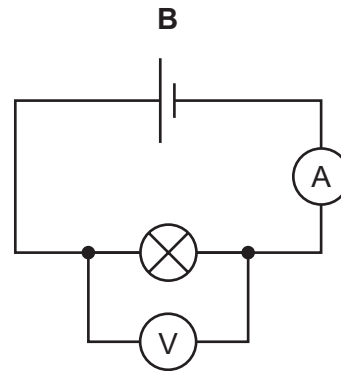
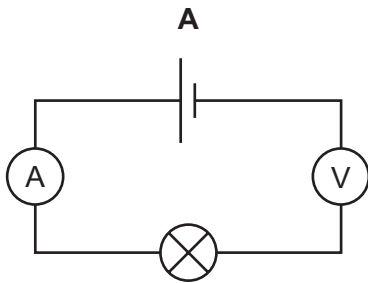


What is the charge on balloon X and what is the charge on balloon Y?

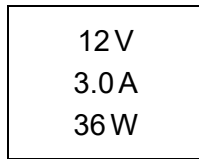
	balloon X	balloon Y
A	negative	negative
B	negative	positive
C	positive	negative
D	positive	positive

- 37 A student sets up a circuit to measure the current in a lamp and the potential difference (p.d.) across it.

Which circuit shows the correct connection of the ammeter and the voltmeter?



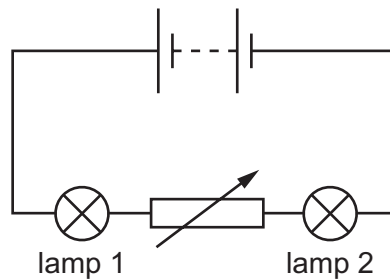
38 The diagram shows a label on the side of a lamp.



What is the resistance of the lamp when it is operating normally?

- A** $0.25\ \Omega$ **B** $0.33\ \Omega$ **C** $3.0\ \Omega$ **D** $4.0\ \Omega$

39 A circuit contains two lamps and a variable resistor.



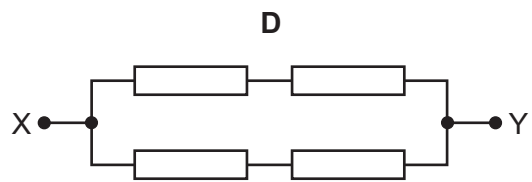
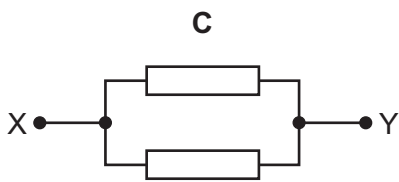
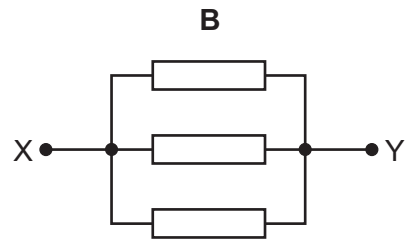
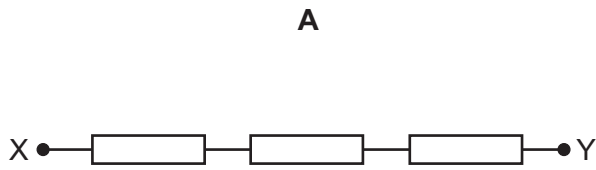
The resistance of the variable resistor is increased.

What happens to the brightness of lamp 1 and what happens to the brightness of lamp 2?

	brightness of lamp 1	brightness of lamp 2
A	decreases	decreases
B	decreases	increases
C	no change	decreases
D	no change	increases

40 Identical resistors are connected together in different arrangements.

Which arrangement has the greatest resistance between points X and Y?



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