



**Cambridge Assessment International Education**  
Cambridge International General Certificate of Secondary Education

**COMBINED SCIENCE**

Paper 1 Multiple Choice (Core)

**0653/13**

**May/June 2019**

**45 minutes**

Additional Materials: Multiple Choice Answer Sheet  
Soft clean eraser  
Soft pencil (type B or HB is recommended)



**READ THESE INSTRUCTIONS FIRST**

Write in soft pencil.

Do not use staples, paper clips, glue or correction fluid.

Write your name, centre number and candidate number on the Answer Sheet in the spaces provided unless this has been done for you.

**DO NOT WRITE IN ANY BARCODES.**

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 separate Answer Sheet.

**Read the instructions on the Answer Sheet very carefully.**

Each correct answer will score one mark. A mark will not be deducted for a wrong answer.

Any rough working should be done in this booklet.

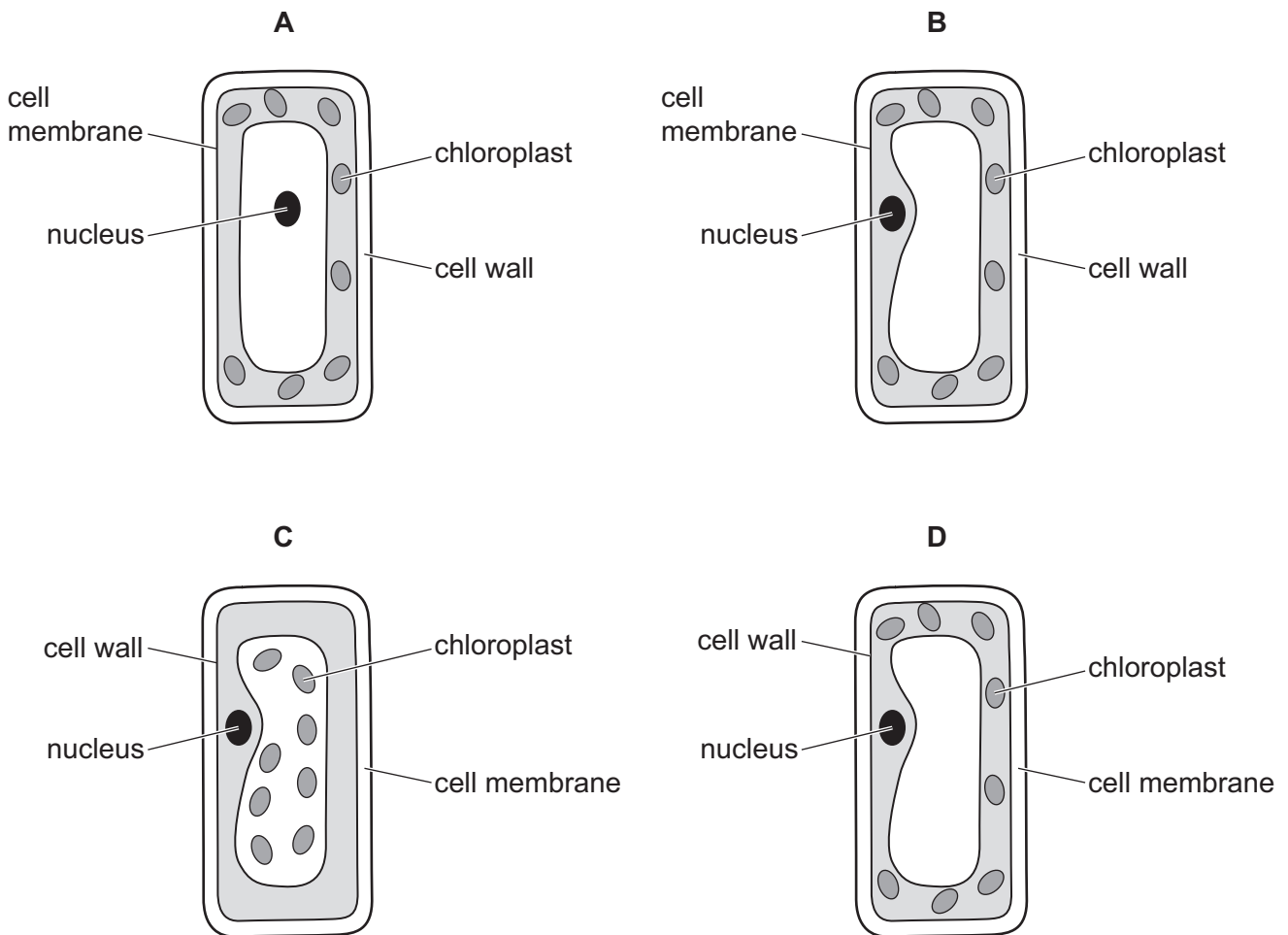
A copy of the Periodic Table is printed on page 16.

Electronic calculators may be used.

This document consists of **15** printed pages and **1** blank page.



1 Which diagram correctly represents a plant cell?



2 Which substance moves through a partially permeable membrane by osmosis?

- A hormones
- B oxygen
- C sugar
- D water

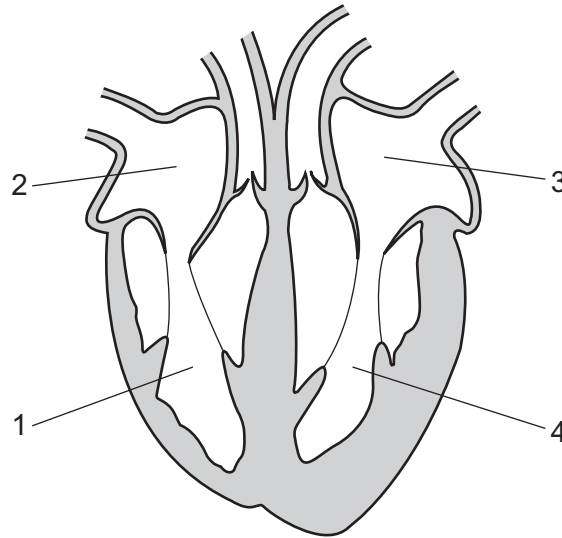
3 Which substances are used and produced during photosynthesis?

	substances used	substances produced
A	carbon dioxide and glucose	oxygen and water
B	carbon dioxide and water	glucose and oxygen
C	glucose and oxygen	carbon dioxide and water
D	oxygen and water	carbon dioxide and glucose

4 What is a function of the small intestine?

- A It cuts food into small pieces.
- B It provides a large surface area for absorption.
- C It provides space for the storage of faeces.
- D It stores food.

5 The diagram shows a section through the heart.



Which labels show the two ventricles in the heart?

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

6 Physical activity affects our rate and depth of breathing.

What happens during **increased** physical activity?

	rate of breathing	depth of breathing
<b>A</b>	decreases	decreases
<b>B</b>	decreases	increases
<b>C</b>	increases	decreases
<b>D</b>	increases	increases

7 How does adrenaline affect blood glucose concentration and pulse rate?

	blood glucose concentration	pulse rate
<b>A</b>	decreases	decreases
<b>B</b>	decreases	increases
<b>C</b>	increases	decreases
<b>D</b>	increases	increases

8 Diagram 1 shows a growing seedling after the first few days' growth.

The seedling was then rotated, held in the position shown in diagram 2 and placed in the dark for three days.

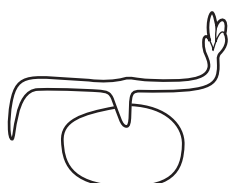


diagram 1

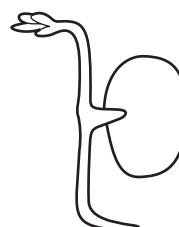


diagram 2

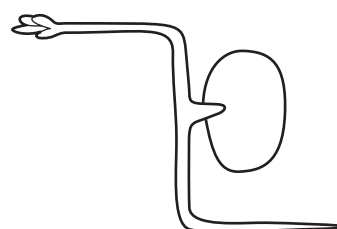
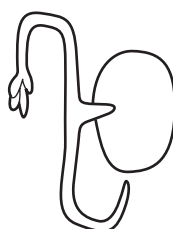
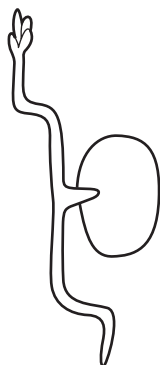
What is the shape of the seedling three days later?

**A**

**B**

**C**

**D**



9 What are the features of sexual reproduction?

	fusion of nuclei	nature of offspring
<b>A</b>	no	genetically dissimilar
<b>B</b>	yes	genetically identical
<b>C</b>	no	genetically identical
<b>D</b>	yes	genetically dissimilar

10 Which process is the transfer of pollen grains from the anther to the stigma?

- A** fertilisation
- B** germination
- C** pollination
- D** transpiration

11 During sexual intercourse the penis transfers sperm cells to the vagina.

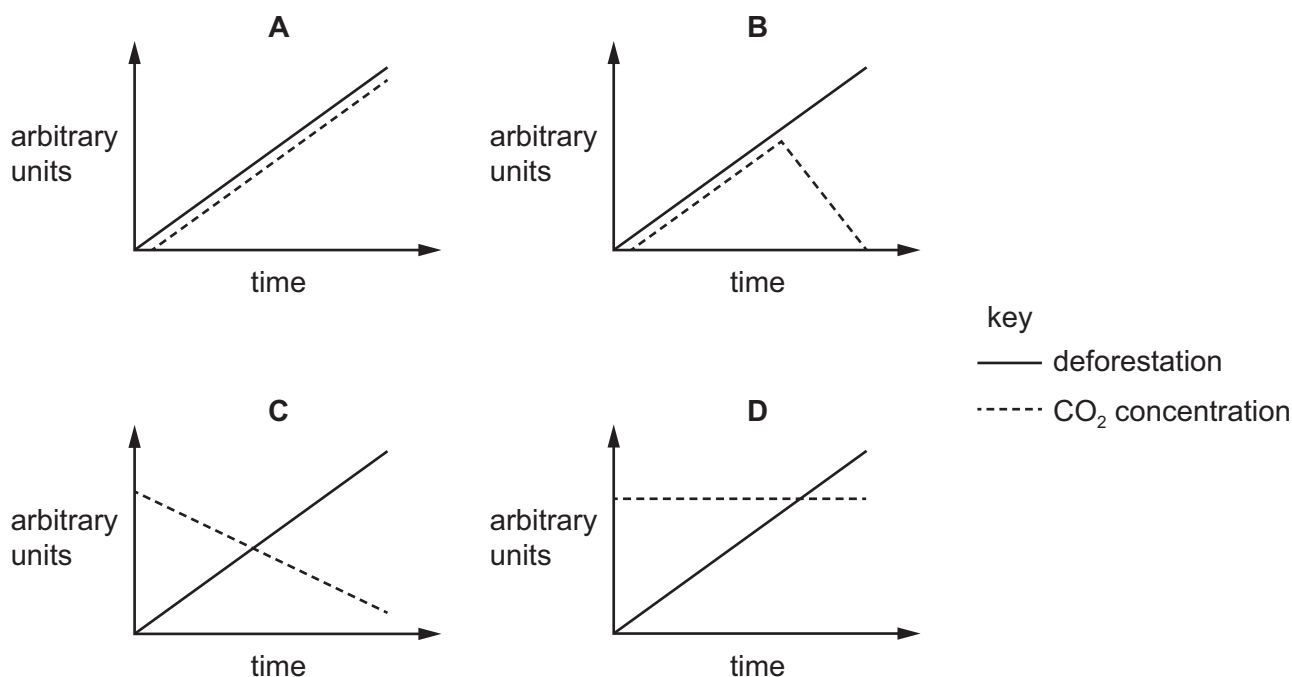
What is the pathway for sperm cells from their site of production to the vagina?

- A** sperm ducts → testes → urethra → vagina
- B** testes → sperm ducts → urethra → vagina
- C** testes → urethra → sperm ducts → vagina
- D** urethra → testes → sperm ducts → vagina

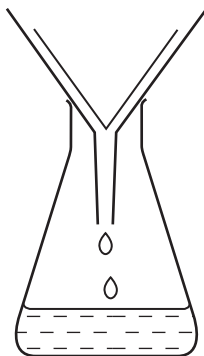
12 What is the source of energy input in food chains and food webs?

- A** carbohydrates
- B** nutrients in the soil
- C** oxygen
- D** the Sun

- 13 Which graph shows the relationship between the increase in deforestation and the carbon dioxide concentrations in the atmosphere?



- 14 The diagram shows apparatus used for filtration.



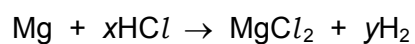
Why can sugar and salt **not** be separated by using this apparatus?

- A** They are both compounds.
- B** They are both white.
- C** They both dissolve in water.
- D** They both have the same size particles.

15 Which description of the named substance is correct?

	substance	element or mixture
<b>A</b>	air	mixture
<b>B</b>	brass	element
<b>C</b>	carbon dioxide	element
<b>D</b>	hydrogen chloride	mixture

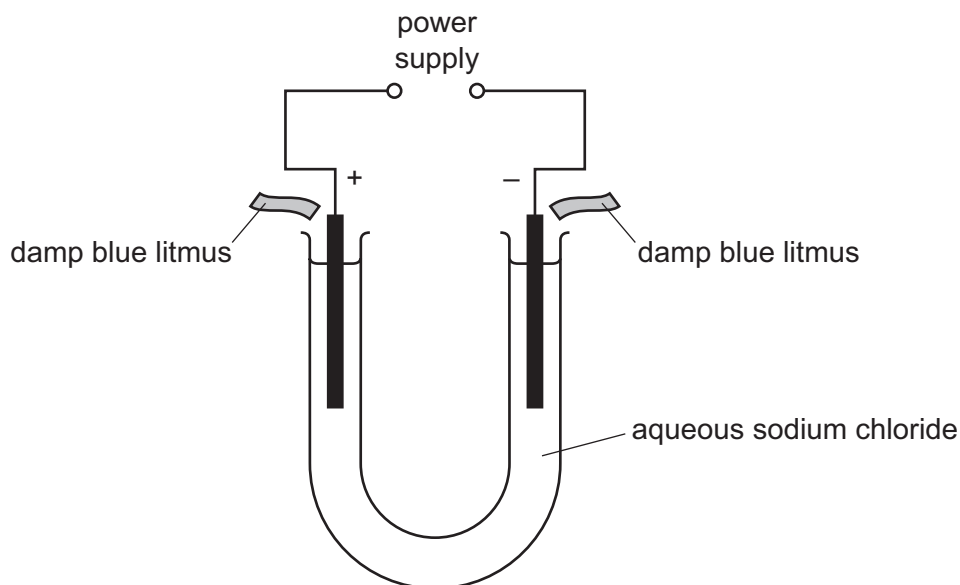
16 The equation for the reaction between magnesium and dilute hydrochloric acid is shown.



What are the values of  $x$  and  $y$ ?

	$x$	$y$
<b>A</b>	1	1
<b>B</b>	1	2
<b>C</b>	2	1
<b>D</b>	2	2

17 Concentrated aqueous sodium chloride is electrolysed using the apparatus shown.



A piece of damp blue litmus paper is held above each electrode.

Which row shows what happens to the colour of the litmus paper during the electrolysis?

	positive electrode	negative electrode
<b>A</b>	litmus is unchanged	litmus is unchanged
<b>B</b>	litmus is unchanged	litmus turns white
<b>C</b>	litmus turns white	litmus is unchanged
<b>D</b>	litmus turns white	litmus turns white

18 The temperatures at the start and at the end of four chemical reactions are shown.

Which reaction is the **most** exothermic?

	temperature at start of reaction / °C	temperature at end of reaction / °C
<b>A</b>	10	30
<b>B</b>	15	14
<b>C</b>	18	35
<b>D</b>	20	18



- 19 Zinc reacts with excess dilute sulfuric acid to form hydrogen gas.

Copper sulfate can act as a catalyst for this reaction.

Which statement is **not** correct?

- A If more concentrated sulfuric acid is used the rate of the reaction increases.
  - B If the temperature is increased it takes less time for the zinc to react completely.
  - C Larger pieces of zinc produce more hydrogen every ten seconds than the same mass of powdered zinc.
  - D When copper sulfate is added to the mixture more hydrogen is formed every second.
- 20 When hydrogen gas is passed over heated lead oxide, lead and water are produced.



Which substance is reduced during the reaction?

- A hydrogen
  - B lead
  - C lead oxide
  - D water
- 21 Which aqueous ion gives a white precipitate with aqueous sodium hydroxide and with aqueous ammonia?
- A  $\text{Cu}^{2+}$
  - B  $\text{Fe}^{2+}$
  - C  $\text{Fe}^{3+}$
  - D  $\text{Zn}^{2+}$

- 22 Which row describes the physical state of the Group VII elements at room temperature?

	chlorine	bromine	iodine
A	gas	gas	liquid
B	gas	liquid	solid
C	liquid	liquid	gas
D	liquid	solid	solid

- 23 Which two elements do **not** form an alloy?

- A carbon and sulfur
- B carbon and iron
- C copper and zinc
- D silver and gold

- 24 Which process is used to extract copper from copper oxide?
- A heating copper oxide with carbon
  - B heating copper oxide with carbon dioxide
  - C heating copper oxide with hydrochloric acid
  - D heating copper oxide with steam
- 25 Why is chlorine added to water during its purification for drinking?
- A to dissolve solid impurities
  - B to kill microorganisms
  - C to remove halide ions
  - D to remove soluble impurities
- 26 Which statement shows that petroleum is a mixture?
- A Petroleum can be burned as a fuel.
  - B Petroleum can be separated into fractions by distillation.
  - C Petroleum is a fossil fuel formed over millions of years.
  - D Petroleum is a thick, black liquid.
- 27 Which substances react together?
- 1 ethene and methane
  - 2 ethene and bromine
  - 3 ethene and oxygen
- A 1, 2 and 3      B 1 and 2 only      C 1 and 3 only      D 2 and 3 only
- 28 A bag of flour has a mass of 540 g. The acceleration of free fall is  $10 \text{ m/s}^2$ .  
What is the weight of the bag of flour?
- A 5.4 N      B 54 N      C 540 N      D 5400 N
- 29 What is the expression for density?
- A  $\frac{\text{mass}}{\text{volume}}$       B  $\frac{\text{volume}}{\text{mass}}$       C  $\frac{\text{volume}}{\text{weight}}$       D  $\frac{\text{weight}}{\text{volume}}$

30 Which property of an object **cannot** be changed by a force?

- A mass
- B motion
- C shape
- D size

31 The temperature of a gas rises.

What happens to the molecules of the gas?

- A Their average speed decreases.
- B Their average speed increases.
- C They contract.
- D They expand.

32 Benzene and glycerine are two substances.

The table gives the melting point and the boiling point of benzene and of glycerine.

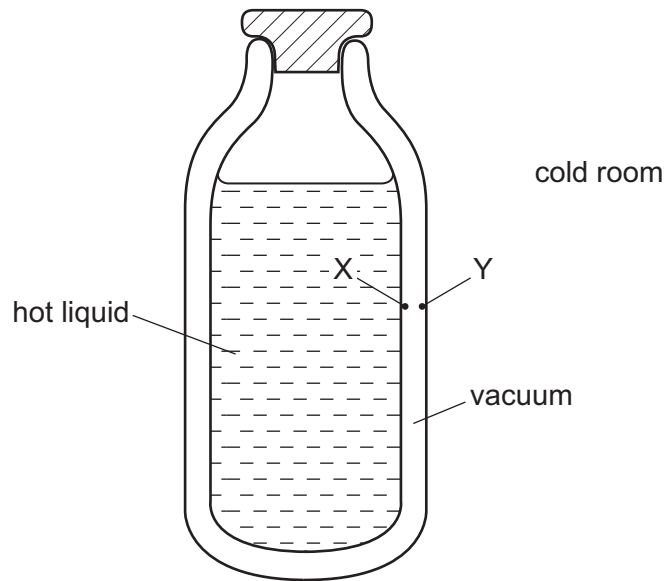
	melting point/°C	boiling point/°C
benzene	5.4	80
glycerine	18	290

At which temperature are both benzene and glycerine liquid?

- A 0 °C
- B 50 °C
- C 90 °C
- D 300 °C

**33** The diagram shows a vacuum flask containing a hot liquid in a cold room.

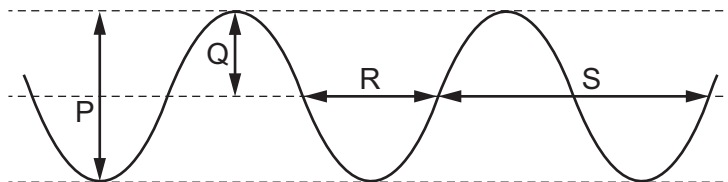
X and Y are points on the inside surfaces of the walls of the flask.



How is thermal energy transferred through the vacuum between X and Y?

- A** by conduction and convection
- B** by conduction only
- C** by radiation and convection
- D** by radiation only

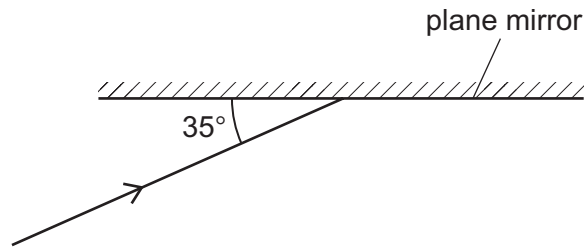
**34** The diagram represents a wave at one moment.



Which labelled arrows represent the amplitude and the wavelength of the wave?

	amplitude	wavelength
<b>A</b>	P	R
<b>B</b>	P	S
<b>C</b>	Q	R
<b>D</b>	Q	S

- 35 The diagram shows light incident on a plane mirror.



The angle between the ray and the mirror is  $35^\circ$ .

What is the angle of reflection?

- A**  $35^\circ$                       **B**  $55^\circ$                       **C**  $70^\circ$                       **D**  $110^\circ$
- 36 Which electromagnetic radiation has the lowest frequency?
- A** gamma  
**B** infrared  
**C** radio  
**D** ultraviolet
- 37 Three loudspeakers vibrate at different frequencies of 5 hertz, 15 kilohertz and 50 kilohertz.

Which row shows whether the vibrations from each loudspeaker can be heard by a healthy human ear?

	5 hertz	15 kilohertz	50 kilohertz
<b>A</b>	no	no	no
<b>B</b>	no	yes	no
<b>C</b>	yes	no	yes
<b>D</b>	yes	yes	yes

38 What is the unit for electromotive force (e.m.f.)?

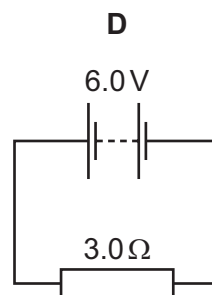
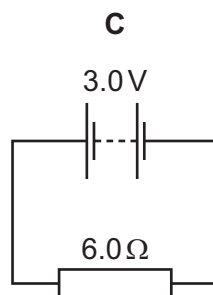
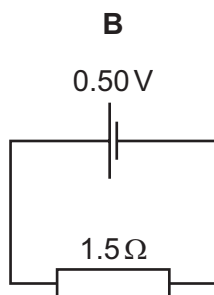
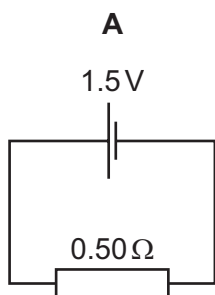
A J

B N

C V

D W

39 In which circuit is there a current of 2.0 A?



40 A mains circuit can safely supply a current of up to 40 A.

The current in a hairdryer is 2 A when it is operating normally. The hairdryer is connected to the mains by a lead which can safely carry up to 5 A.

What is the correct fuse to protect the hairdryer?

A 1 A fuse

B 3 A fuse

C 10 A fuse

D 50 A fuse

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