



## SCIENCE (BIOLOGY)

5106/05

Paper 5 Multiple Choice

For Examination from 2024

SPECIMEN PAPER

Papers 5 and 6: 1 hour 15 minutes

Additional Materials: Multiple Choice Answer Sheet



### READ THESE INSTRUCTIONS FIRST

Write in soft pencil.

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

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

**DO NOT WRITE ON ANY BARCODES.**

There are **twenty** 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.**

Answers to Paper 5 and paper 6 must be handed in separately.

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

You are advised to spend no more than **30 minutes** on **Paper 5**.

You may proceed to answer Paper 6 as soon as you have completed Paper 5.

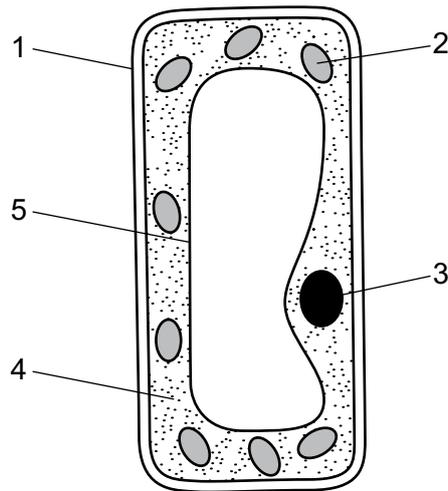
Any rough working should be done in this booklet.

The use of an approved scientific calculator is expected, where appropriate.

This document consists of **9** printed pages and **1** blank page.



- 1 The diagram shows a plant cell from a leaf, as observed under a light microscope.



Which parts are **not** found in animal cells?

- A** 1 and 2      **B** 2 and 3      **C** 3 and 4      **D** 4 and 5
- 2 Which of the structures contain a nucleus?

	red blood cell	root hair cell	mature xylem vessel
<b>A</b>	✓	✓	✓
<b>B</b>	✓	✗	✗
<b>C</b>	✗	✓	✗
<b>D</b>	✗	✗	✓

key

✓ = contains nucleus

✗ = no nucleus

- 3 Four foods are labelled A, B, C and D. Food tests were carried out on the four food samples.

Which food contains starch and reducing sugar?

	Benedict's test	biuret test	iodine test
<b>A</b>	✓	✓	✗
<b>B</b>	✓	✗	✓
<b>C</b>	✗	✗	✓
<b>D</b>	✗	✓	✗

key

✓ = positive result

✗ = negative result

- 4 The diagram shows part of a starch molecule.



Which diagram shows the result after this molecule has been completely digested?

- A**
- B**
- C**
- D**

- 5 A protease is added to a suspension of cooked egg white in a test-tube and kept at 37 °C.

After eight minutes, the protein changes from white to clear.

Which product, or products, will now be present in the test-tube?

- A** a simple sugar
- B** fatty acids and glycerol
- C** polypeptides
- D** water
- 6 Six test-tubes containing identical mixtures of starch and amylase solutions are placed in water-baths at different temperatures.

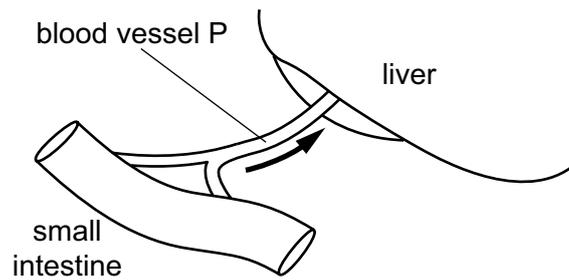
The table shows the time taken for the starch to be digested in each test-tube.

temperature/°C	15	25	35	45	55	65
time/seconds	35	22	13	5	35	66

Based on these results, which is the optimum temperature of amylase activity?

- A** 15 °C      **B** 35 °C      **C** 45 °C      **D** 65 °C

- 7 The diagram shows blood vessel P which carries digested food from the small intestine to the liver.

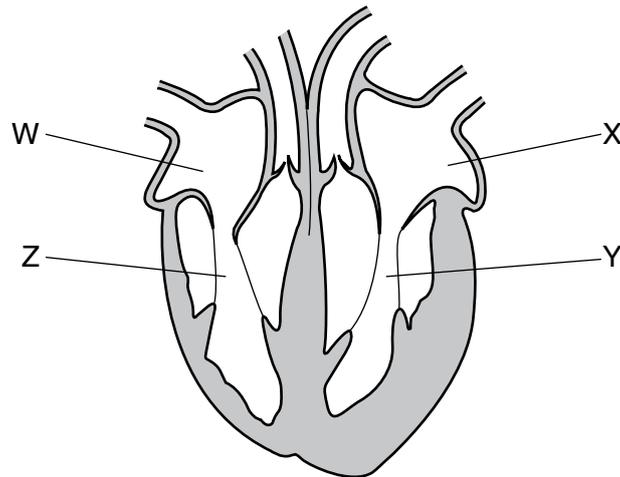


Which row describes the level of glucose in blood vessel P and the change to the level of glycogen in the liver, shortly after a meal containing carbohydrates?

	glucose in blood vessel P	glycogen in liver
<b>A</b>	high	decreasing
<b>B</b>	high	increasing
<b>C</b>	low	decreasing
<b>D</b>	low	increasing

- 8 What is a characteristic of all human hormones?
- A** broken down by the kidneys
  - B** produced by a target organ
  - C** produced in the liver
  - D** transported in the blood
- 9 Which is correct for the condition type 2 *diabetes mellitus*?
- A** It is caused by excess production of insulin.
  - B** It is caused by lack of glucagon.
  - C** It is linked to a persistently high blood sugar concentration.
  - D** It is linked to high levels of exercise.

10 The diagram shows the human heart.

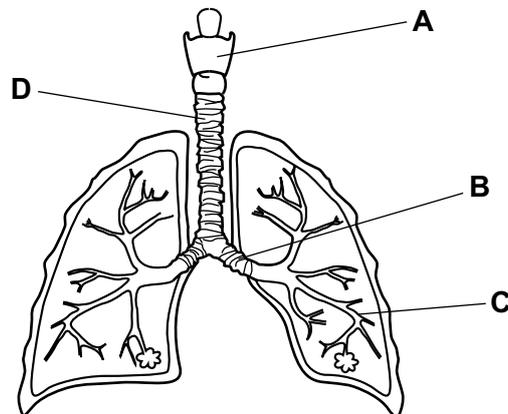


In which two chambers will the muscles contract at the same time?

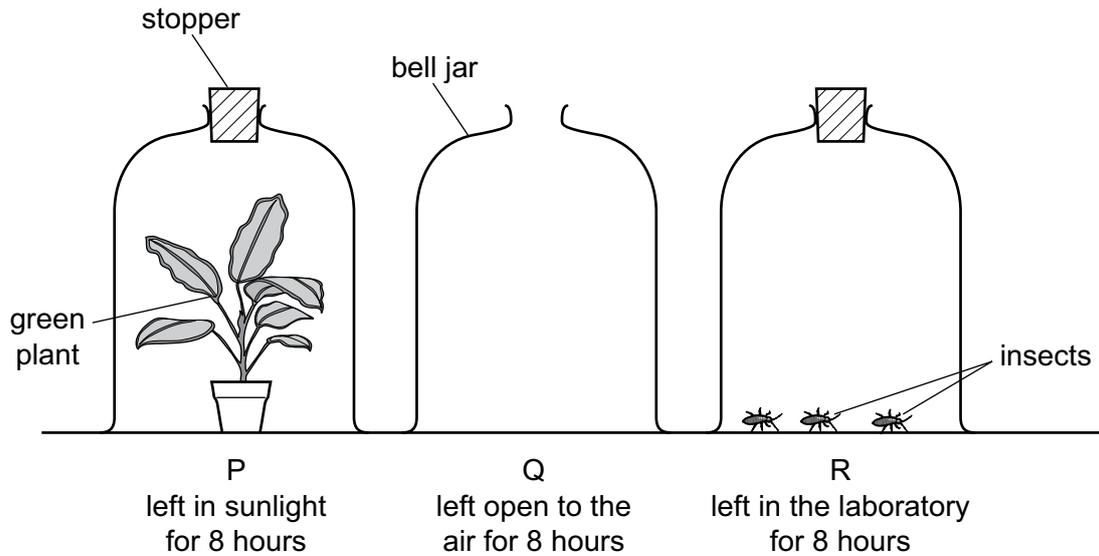
- A** W and X      **B** W and Z      **C** X and Z      **D** X and Y

11 The diagram shows the human gas exchange system.

Which structure is the larynx?



12 In an experiment, three glass bell jars were set up as shown in the diagram.



At the end of the experiment, which bell jar has the most oxygen and which has the least?

	most oxygen	least oxygen
<b>A</b>	P	Q
<b>B</b>	P	R
<b>C</b>	Q	P
<b>D</b>	R	P

13 What are the effects of tobacco smoke on the gas exchange system?

	mucus in the airways	chance of lung infection
<b>A</b>	decreased	decreased
<b>B</b>	decreased	increased
<b>C</b>	increased	decreased
<b>D</b>	increased	increased

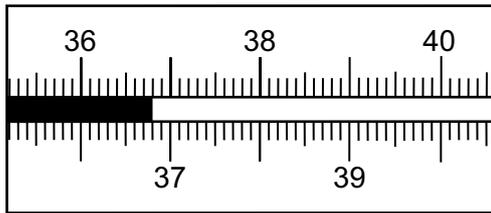
14 An athlete respire anaerobically during a race, which causes lactic acid to build up in the leg muscles.

How does rapid and deep breathing after the race help to remove the lactic acid?

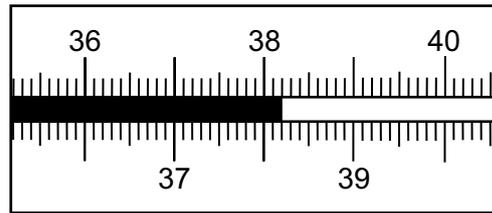
- A** by using up more carbon dioxide
- B** by providing more energy
- C** by breathing out more lactic acid
- D** by breathing in more oxygen

- 15 A change in body temperature is a common symptom of influenza.

The diagram shows the readings on a thermometer for a person without influenza and when the person has influenza.



temperature without influenza



temperature with influenza

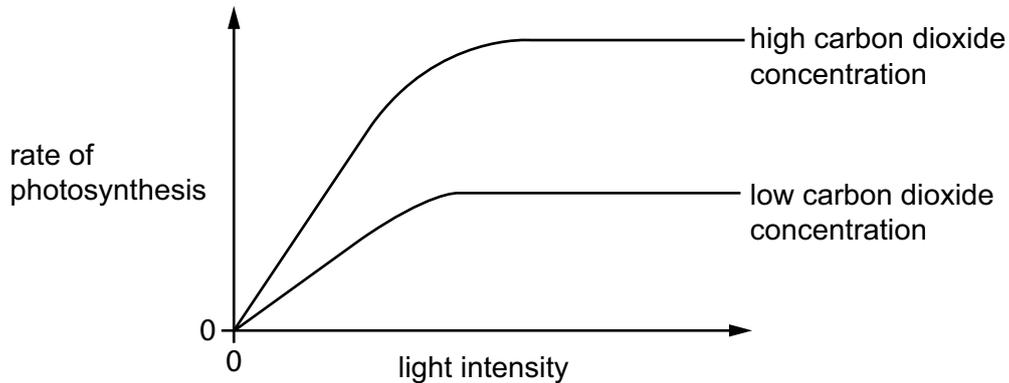
Which row shows the readings on the thermometer?

	temperature without influenza in °C	temperature with influenza in °C
<b>A</b>	36.8	38.2
<b>B</b>	36.8	38.0
<b>C</b>	37.0	38.2
<b>D</b>	37.0	38.0

- 16 Which row shows the most likely number of chloroplasts in three types of cell in a typical dicotyledonous leaf?

	epidermal cell	palisade mesophyll cell	guard cell
<b>A</b>	0	6	17
<b>B</b>	0	17	6
<b>C</b>	6	17	0
<b>D</b>	17	0	6

- 17** The graph shows how the rate of photosynthesis of a plant varies with light intensity at two different carbon dioxide concentrations. The temperature is kept constant at 20 °C.



Which of the following can be concluded from this graph?

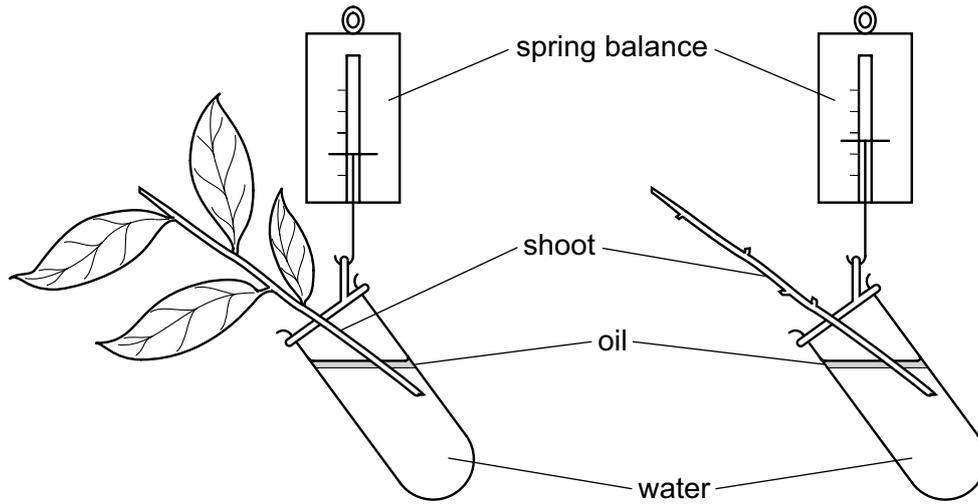
- A** An increase in temperature increases the rate of photosynthesis.  
**B** The rate of photosynthesis always increases as the light intensity increases.  
**C** An increase in carbon dioxide concentration increases the rate of photosynthesis.  
**D** Water and carbon dioxide are required for photosynthesis.
- 18** The table shows the rates of water absorption and transpiration for a plant during a morning.

time	08:00	09:00	10:00	11:00
rate of water absorption/cm <sup>3</sup> per hour	15	16	16	17
rate of transpiration/cm <sup>3</sup> per hour	7	12	16	19

At what time does the plant show signs of wilting?

- A** 08:00      **B** 09:00      **C** 10:00      **D** 11:00
- 19** On a dry, sunny day, what is the net movement of water vapour through the stomata of a leaf?
- A** into the leaf by diffusion  
**B** into the leaf by osmosis  
**C** out of the leaf by diffusion  
**D** out of the leaf by osmosis

20 The diagram shows two shoots at the start of an investigation about transpiration.



Which describes an appropriate function of a piece of apparatus or material used in this set-up?

- A Oil is used to stop water evaporating.
- B The spring balance is used to measure the volume of water.
- C Two plant shoots are used so that an average rate of transpiration is measured.
- D The plant shoots are placed in water to provide oxygen.

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