



Rewarding Learning

General Certificate of Secondary Education
2025

Centre Number

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Candidate Number

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Double Award Science Biology

Unit B2
Foundation Tier



[GDW41]

GDW41

MONDAY 9 JUNE, MORNING

TIME

1 hour 15 minutes.

INSTRUCTIONS TO CANDIDATES

Write your Centre Number and Candidate Number in the spaces provided at the top of this page.

You must answer the questions in the spaces provided.

Do not write outside the boxed area on each page or on blank pages.

Complete questions in black ink and use a dark HB pencil for drawings and graphs.

Do not write with a gel pen.

Answer **all nine** questions.

INFORMATION FOR CANDIDATES

The total mark for this paper is 70.

Figures in brackets printed down the right-hand side of pages indicate the marks awarded to each question or part question.

You may use a scientific calculator.

Quality of written communication will be assessed in Question 8.



1 Three components of blood and their functions are given below.

(a) Use a ruler to draw a line from each component of blood to its function(s).

Platelets have **two** functions.

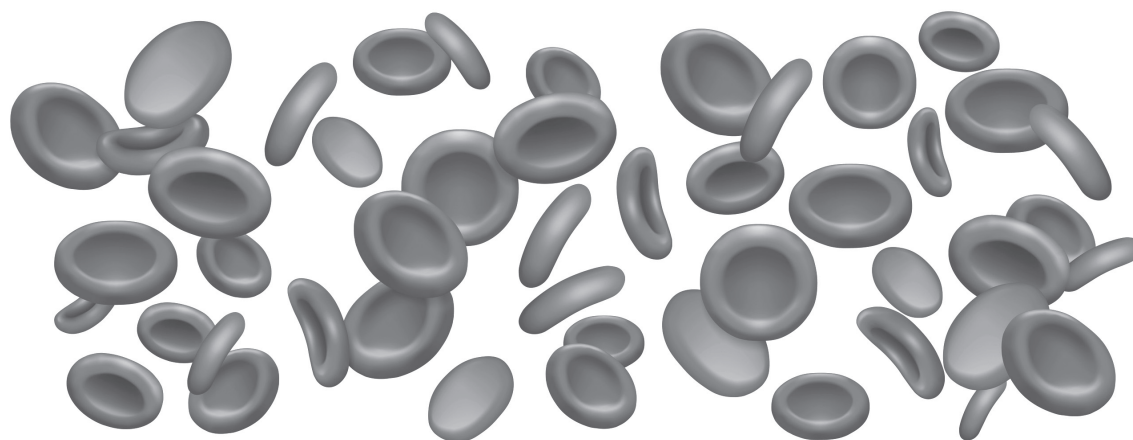
Component of blood	Function
white blood cells	convert fibrinogen to fibrin
	transports food molecules
plasma	cause blood clotting
	defend against disease
platelets	

[3]



(b) Red blood cells are also a component of blood.

The diagram shows some red blood cells.



Red blood cells are adapted to transport oxygen.

(i) Which structure, normally present in animal cells, is **not** found in red blood cells?

[1]

(ii) Give the term that describes the **shape** of red blood cells.

[1]

Red blood cells contain haemoglobin.

(iii) Name the mineral found in haemoglobin.

Circle the answer in the list.

magnesium	calcium	iron
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[1]

(c) Name **one waste** substance that is transported in the blood.

[1]

[Turn over



2 (a) Name **two** female sex hormones.

1. _____

2. _____

[2]

The table gives some secondary sexual characteristics.

(b) Complete the table to show if each characteristic applies **only** to males, **only** to females or to **both** males and females.

Write a tick (✓) in the correct empty box for each characteristic.

Secondary sexual characteristic	Applies only to males	Applies only to females	Applies to both males and females
body becomes more muscular			
breasts develop			
sexual awareness increases			
facial hair grows			
hips widen			

[5]



- 3 (a) The diagram shows the inside of part of a coronary blood vessel (coronary artery).

This coronary blood vessel has a build-up of substance X.



- (i) Name substance X.

[1]

Coronary blood vessels transport blood to heart muscle cells.

- (ii) Explain how a build-up of substance X in the coronary blood vessels can lead to a heart attack.

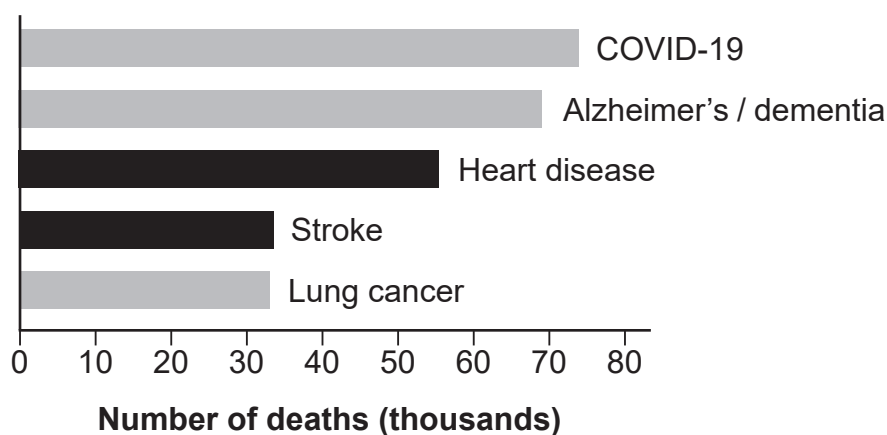
[4]

[Turn over]



- (b) A study into the main causes of death in the United Kingdom (UK) was carried out by the British Heart Foundation in 2021.

The graph shows some of the results of this study.



- (i) Suggest which cause of death would **not** have been on the graph if the study had taken place in 2005.

[1]

These causes of death resulted in a total of 275 668 deaths.

20% of these deaths were caused by heart disease.

- (ii) Calculate the **number** of deaths that were caused by heart disease.

Give your answer to the nearest whole number.

Show your working out.

[3]



(iii) Name **two** medicines that can be used to treat heart disease.

Circle the answers in the list.

angioplasty

insulin

aspirin

statins

stents

[2]

(c) A stroke can occur if blood vessels in a different part of the body become blocked.

(i) Name the organ where a stroke occurs.

[1]

(ii) Give **two** lifestyle changes a person could make to reduce their risk of having a stroke.

1. _____

2. _____ [2]



- 4 The photograph shows some sunflowers.



Sunflowers can be branched (many flowers on a stem) or unbranched (one flower on a stem).

The allele for branched sunflowers (**B**) is dominant to the allele for unbranched sunflowers (**b**).

Branched sunflowers may have the genotype **BB** or the genotype **Bb**.

The term that describes a sunflower with the genotype **Bb** is **heterozygous**.

(a) What term describes the following genotypes?

BB _____

bb _____

[2]



- (b) (i) Draw a Punnett square in the space below to show how a branched and an unbranched sunflower can produce **unbranched** offspring.

[4]

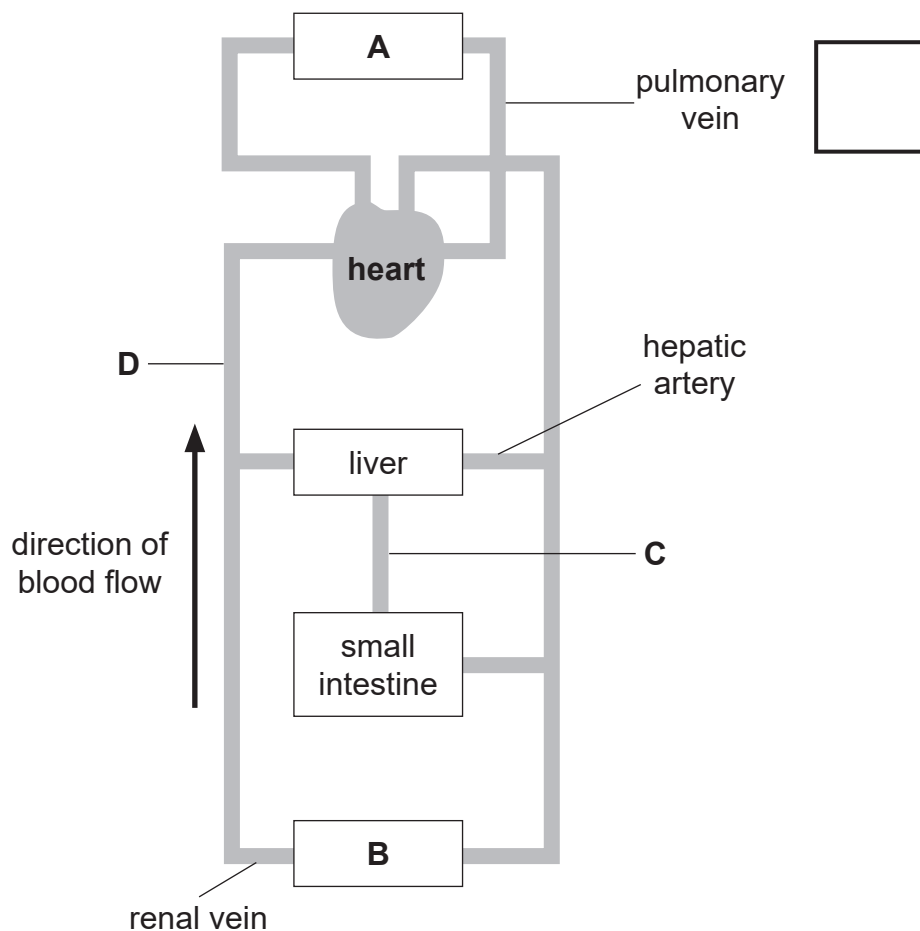
- (ii) What percentage of sunflowers from this cross would you expect to be **branched**?

_____ % [1]

[Turn over]



- 5 The diagram shows part of the circulatory system in the body.



- (a) (i) Name organs **A** and **B**.

A _____

B _____

[2]

- (ii) Draw an arrow in the empty box on the diagram to show the direction of blood flow in the **pulmonary vein**.

[1]

- (iii) Name blood vessels **C** and **D**.

C _____

D _____

[2]



(b) Which **type** of blood vessel:

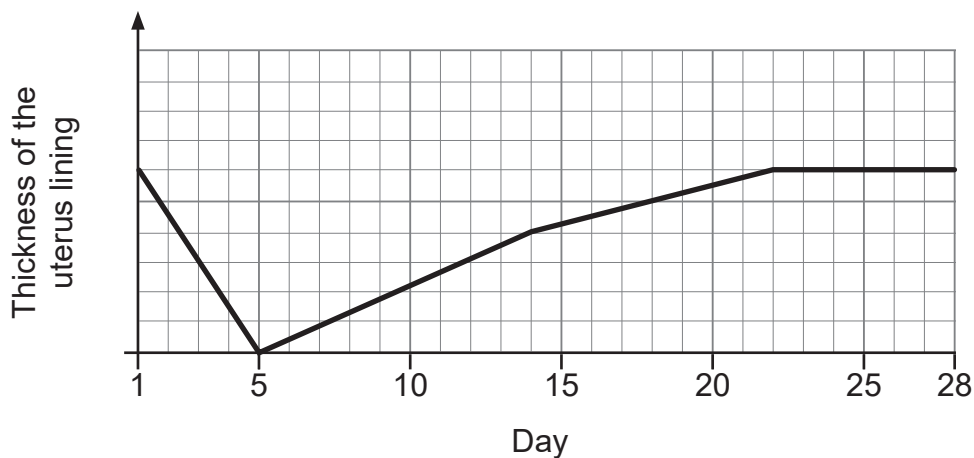
- has thin walls that are one cell thick?

- has valves?

[2]



- 6 The graph shows changes in the thickness of the uterus lining during a 28-day menstrual cycle.



- (a) (i) Between which days in the menstrual cycle, shown above, does menstruation occur?

Between days _____ and _____ [1]

- (ii) Give the day when ovulation usually occurs in a 28-day menstrual cycle.

Day _____ [1]

- (iii) Describe what happens to the uterus lining after day 28 if **fertilisation does not occur**.

_____ [1]



(b) Contraception can be used to prevent pregnancy.

- (i) Suggest **one** ethical reason why people may choose **not** to use contraception.

_____ [1]

One method of contraception is the contraceptive pill.

The contraceptive pill does not prevent the spread of sexually transmitted infections (STIs).

- (ii) Name **one** STI caused by bacteria.

_____ [1]

- (iii) Name **one** STI caused by viruses.

_____ [1]



7 The body defends itself against disease-causing microorganisms, including bacteria, in several ways.

(a) Complete the sentences about some of the ways the body defends itself against bacteria.

The skin provides a _____ against bacteria.

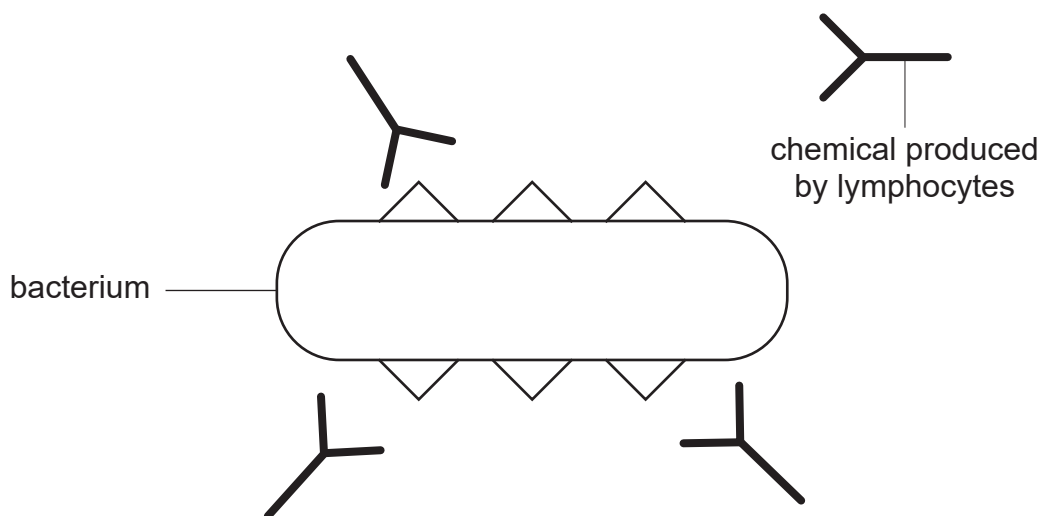
Mucous membranes in the nose and throat _____
bacteria.

Blood _____ stops the loss of blood and prevents
the entry of bacteria.

[3]

(b) Another type of defence against bacteria involves lymphocytes.

The diagram shows a bacterium and the chemicals produced by lymphocytes after infection by this bacterium.



(i) Name the chemicals produced by lymphocytes.

[1]



If a person is infected again with the **same** type of bacteria, a secondary response is produced.

Therefore, this person does not develop any symptoms.

(ii) Explain why.

[3]



- 8 Chemicals, such as carbon monoxide, in tobacco smoke have harmful effects on the body.

Name the other **two** main chemicals in tobacco smoke and describe the harmful effects of each on the body.

In this question you will be assessed on the quality of your written communication skills, including the use of specialist scientific terms.

Name and harmful effects of chemical 1

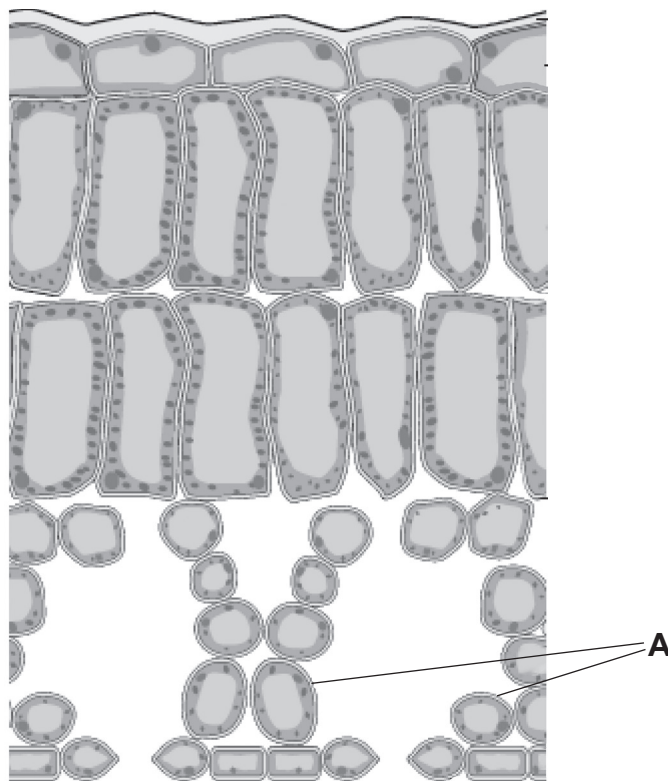
Name and harmful effects of chemical 2

[6]



- 9 (a) Transpiration is the evaporation of water from cells in a leaf followed by diffusion into the atmosphere.

The diagram shows part of a leaf.



Use the diagram to answer the following questions.

Water evaporates from the cells, labelled **A**, in a leaf.

- (i) Name the cells labelled **A**.

[1]

- (ii) Name the **two** parts of the leaf that water diffuses through after it evaporates from the cells labelled **A**.

1. _____

2. _____

[2]

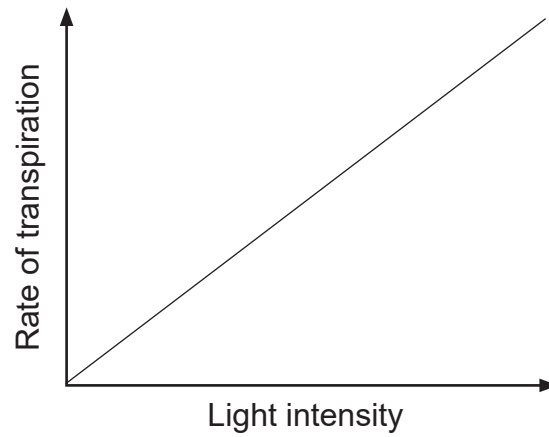
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(b) Several environmental factors affect the rate of transpiration.

One of these factors is light intensity.

The graph below shows how light intensity affects the rate of transpiration.



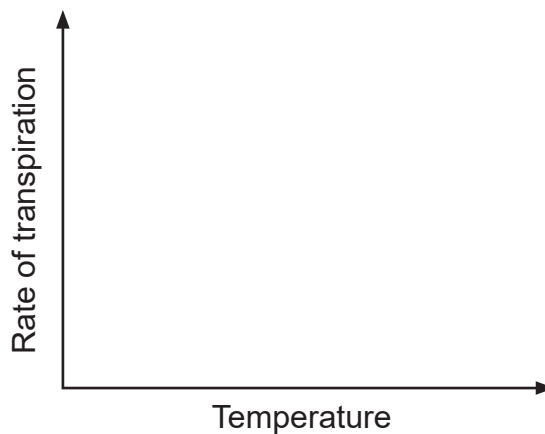
(i) Describe the trend shown by the graph.

[1]



Another environmental factor that affects the rate of transpiration is temperature.

- (ii) On the axes below, **draw a line** to show how increasing temperature affects the rate of transpiration.



[1]

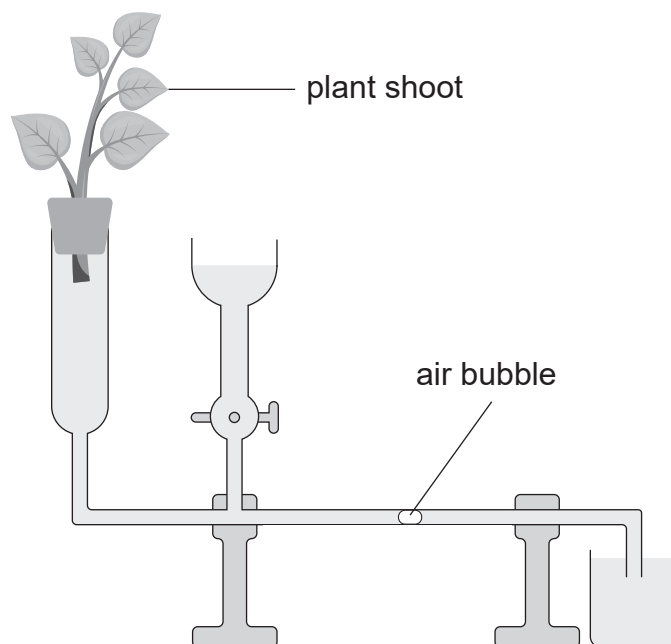
- (iii) Name one **other** environmental factor that affects the rate of transpiration.

[1]

[Turn over



The diagram shows a potometer which can be used to investigate water uptake by a plant shoot.



(c) Describe and explain what will happen to the air bubble as transpiration occurs.

Description _____

Explanation _____

[3]



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Question Number	Marks
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Examiner Number

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