Rewarding Learning

Centre Number

Candidate Number

General Certificate of Secondary Education
2025–2026

Single Award Science: Biology

Unit 1

Higher Tier

[GSA12]

GSA12

MONDAY 10 NOVEMBER 2025, MORNING

TIME

1 hour.

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.

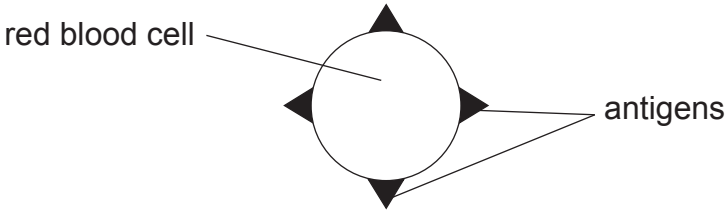
INFORMATION FOR CANDIDATES

The total mark for this paper is 60.
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 **3(b)**.

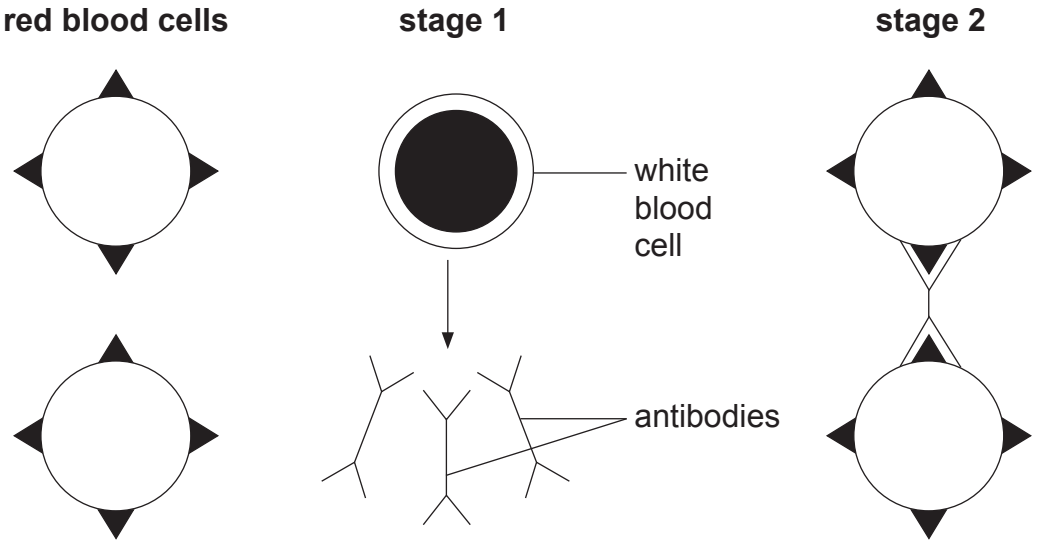
14856

24GSA1201

1 **(a)** There are different blood groups in humans.
The diagram below shows the antigens on a red blood cell of a person who is blood group **A**.



The diagram below shows the immune response that would take place if group A red blood cells enter the blood of a person who has a **different** blood group.



(i) Name the type of white blood cell shown in **stage 1**.

_____ [1]

(ii) Use the diagram and your knowledge to explain what is happening at

stage 1. _____

_____

stage 2. _____

_____ [2]

(b) The table below shows the percentage of people in the UK in four different blood groups.

Blood group	Percentage of people in the UK
A	34
B	10
AB	3
O	53

(i) Calculate the difference in the percentage of people in the UK with blood group O compared to blood group A.

_____ % [1]

Blood groups are an example of **discontinuous** variation in humans.

(ii) Give **one other** example of discontinuous variation in humans.

_____ [1]

(iii) Name the type of graph used to show discontinuous variation.

_____ [1]

(iv) Give **one cause** of variation in humans.

_____ [1]

[Turn over

2 The photograph below shows an American mink which was introduced to the UK in 1929. The American mink can reproduce rapidly and it feeds on another small animal called a water vole. This has caused a decrease in the water vole population in the UK. The American mink will often kill more animals than it can eat.

(a) Using **only** the information above, give **two** reasons why the American mink is described as a competitive invasive species.

1. _____

2. _____ [2]

(b) Suggest what effect, if any, the American mink would have on the biodiversity of an area.

_____ [1]

(c) Poisons are often used to control animal numbers.
A mink control project has been set up in Scotland to trap American mink without killing them.
Once the mink have been caught it is then illegal to release them back into the wild.
The photograph below shows an American mink caught in a trap.

(i) Suggest **one** reason why it is illegal to release the American mink back into the wild.

_____ [1]

(ii) Suggest **one** advantage to **other animals** in the area, of using cages rather than poison to control the numbers of American mink.

_____ [1]

[Turn over

3 **(a)** Alcohol is a drug which is harmful to our health.

(i) Name the organ that is most affected by alcohol.

Circle your answer.

muscles **liver** **lungs**

[1]

(ii) Give the term used to describe drinking a large volume of alcohol in a short period of time.

_____ [1]

(b) Tobacco smoke contains many chemicals which are harmful to our health. Name the **three** main chemicals contained in tobacco smoke and describe the effects each of these chemicals have on our health.

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

_____

_____

_____

_____

_____

_____

_____

_____

_____

_____

_____

[6]

[Turn over

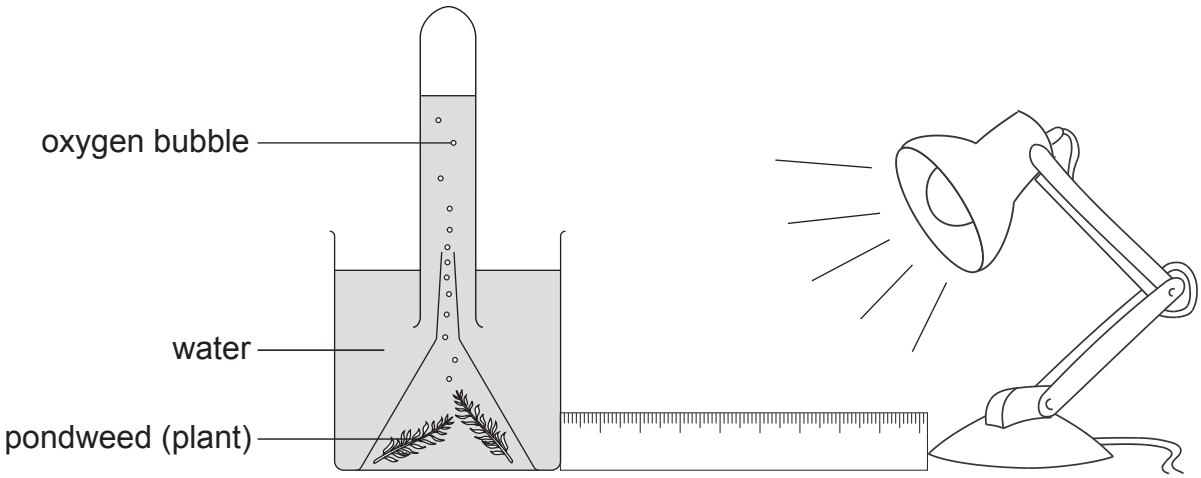
4 Photosynthesis takes place in the chloroplasts of plants.

(a) Complete the balanced symbol equation below for photosynthesis.

$$\boxed{} + 6H_2O \longrightarrow \boxed{} + 6O_2$$

[2]

(b) A student used the apparatus below to investigate the effect of light intensity on photosynthesis.



The student counted the number of oxygen bubbles produced **per minute** when the lamp was 100 cm away from the plant.

(i) Name **one** piece of equipment, **not** shown in the diagram of the apparatus above, that would be needed by the student to carry out this investigation.

_____ [1]

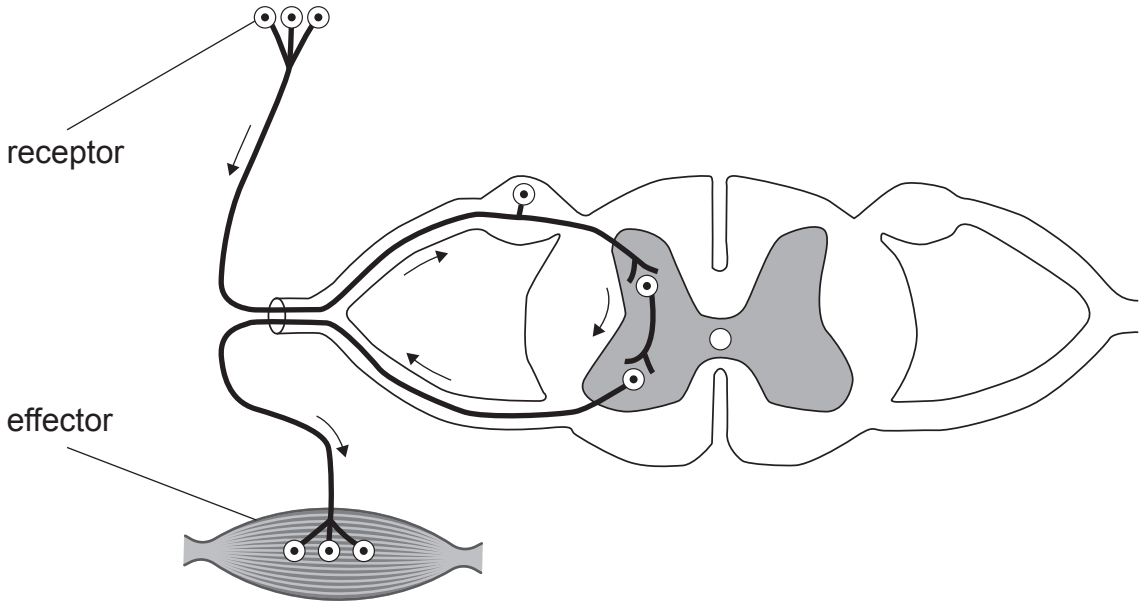
(ii) Suggest what effect, if any, moving the lamp **closer** to the plant would have on the number of bubbles of oxygen produced per minute. Explain your answer.

_____

_____

_____ [2]

5 The diagram below shows a reflex arc.



Use the diagram and your knowledge to answer the following questions.

(a) Name the effector in this reflex arc.

_____ [1]

Nerve impulses pass through three neurones when travelling from the receptor to the effector.

(b) Name these three neurones in the correct order.

1. _____

2. _____

3. _____ [3]

(c) Name the system in the body that controls and co-ordinates the responses between the receptor and effector.

_____ [1]

[Turn over

6 The photograph below shows a small ground finch from the Galapagos Islands. The ground finch is a bird with a small beak that eats small seeds.

Between 1982 and 1983 the Galapagos Islands had ten times more rainfall than normal.

This increased the number of small seeds produced.

Birds with small beaks were able to pick up and eat the small seeds so these birds survived to reproduce.

(a) Complete the sentences below.

The increase in the population of finches with small beaks is an example of

_____ selection. The finches with small beaks were

better _____ to the environment.

They survived to reproduce and pass on the _____

for small beak size to their offspring. [3]

Evolution over a number of generations resulted in the population of finches with small beaks increasing.

(b) What is meant by evolution?

_____

_____ [1]

(c) What causes some species to become extinct?

_____

_____ [1]

[Turn over

7 The table below shows the total number of deaths in Northern Ireland from 2018 to 2022.
The table also shows the percentage of these deaths that were due to cancer and circulatory diseases.

Year	Total number of deaths	Deaths due to cancer /%	Deaths due to circulatory diseases /%
2018	15 922	27.9	22.8
2019	15 758	28.4	23.4
2020	17 614	26.2	21.5
2021	17 558	26.1	21.1
2022	17 159	27.0	22.0

(a) How does the percentage of deaths due to cancer compare to the percentage of deaths due to circulatory diseases?

_____

_____

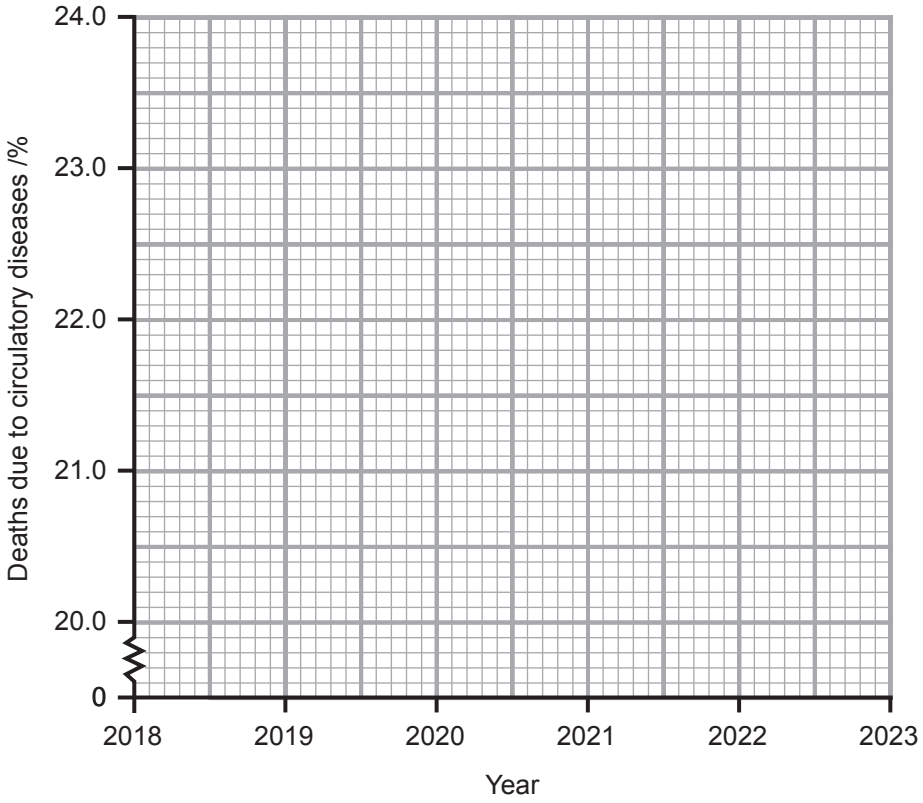
_____ [1]

(b) How are cancer cells produced?

_____

_____ [1]

(c) **(i)** On the grid below, plot and draw a line graph to show the percentage of deaths due to **circulatory diseases**.



[3]

The percentage of deaths due to circulatory diseases in 2023 followed the same trend as from 2021 to 2022.

(ii) Suggest what percentage of deaths were due to circulatory diseases in 2023.

_____ % [1]

[Turn over

The increase in the total number of deaths from 2018 to 2022 was **1237**.

(d) Calculate this increase as a percentage of the total number of deaths in 2018.

Show your working out.

_____ % [2]

(e) Give **two** ways the circulatory system benefits from regular exercise.

1. _____

_____

2. _____

_____ [2]

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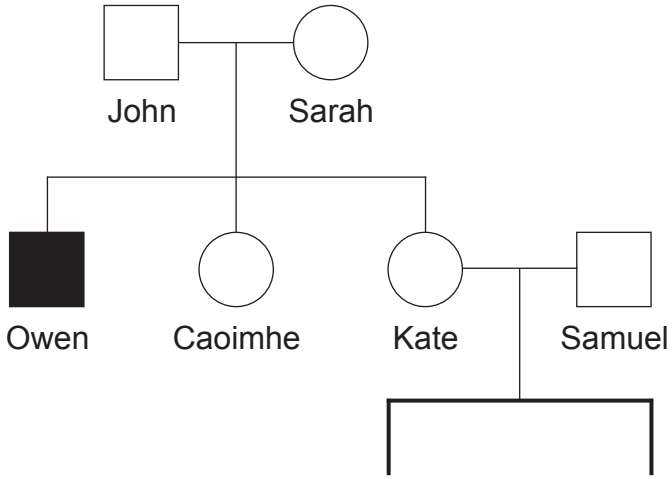
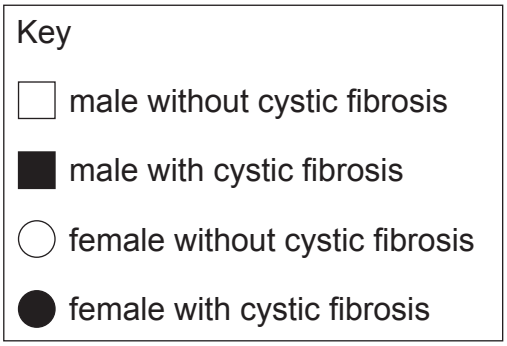
(Questions continue overleaf)

8 **(a)** Cystic fibrosis is an inherited condition which can affect the lungs and digestive system.
The pedigree diagram below shows how this condition is inherited in a family.





Kate and Samuel have two children, one male and one female. The male child has cystic fibrosis but the female child does not have cystic fibrosis.

(i) **Use the key** to show this information in the pedigree diagram above. [2]

The allele for cystic fibrosis (**a**) is recessive to the normal allele (**A**).

(ii) Complete the Punnett square below to show how Kate and Samuel could have a child with cystic fibrosis.

Kate

Samuel

[2]

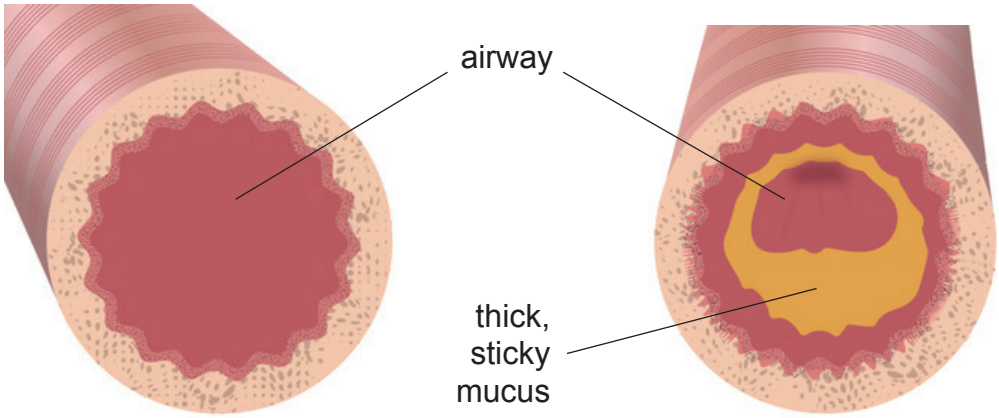
(iii) What term is used to describe the **genotype** of the child with cystic fibrosis?

_____ [1]

Cystic fibrosis can cause a build-up of thick, sticky mucus in the airways of the lungs. Oxygen passes through these airways and enters the blood to be transported to body cells.

(b) The diagrams below show the effect this mucus may have on the airways of the lungs.

airway without thick, sticky mucus | **airway with thick, sticky mucus**



(i) Describe and explain the effect this mucus may have on respiration in the body cells.

_____

_____

_____ [2]

This mucus can trap bacteria that cause infection.

(ii) What chemical can be used to treat a bacterial infection?

_____ [1]

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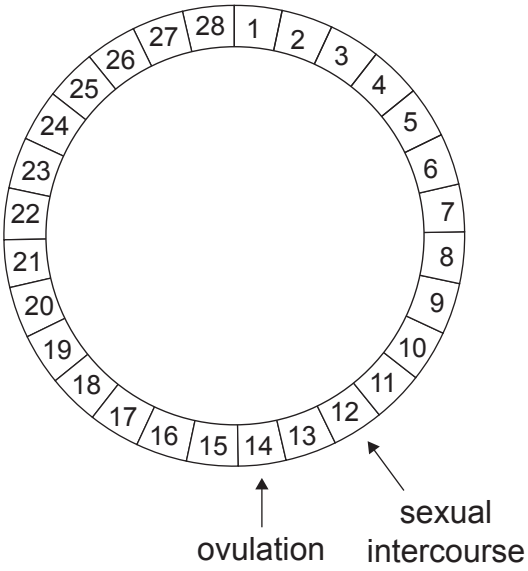
9 **(a)** The diagram below shows a 28-day menstrual cycle.



(i) On the diagram above, shade in the **five days** when menstruation occurs. [1]

(ii) Describe **one** way the uterus lining changes **after** menstruation and name the hormone that controls this change.

Description _____

_____

Hormone _____ [2]

A woman has sexual intercourse on day 12 and sperm are released into her vagina.
Sperm can live within the woman's body for three days.

(iii) Explain why this woman may become pregnant after having sexual intercourse on day 12.

_____

_____

_____ [2]

(b) To prevent pregnancy people can use different methods of contraception. One of these methods also prevents the spread of sexually transmitted infections.

(i) Name this method.

_____ [1]

(ii) Suggest **one** reason why it is important for a young person, hoping to start a family, to protect themselves from getting a sexually transmitted infection.

_____ [1]

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Question 5 . . . . . Principal Examiner
Question 6 . . . . . © Getty Images
Question 7 . . . . . https://www.nisra.gov.uk/publications/registrar-general-annual-report-2022-cause-deaths
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Question Number	**Marks**
1	
2	
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Total Marks	

Examiner Number

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