

Please check the examination details below before entering your candidate information

Candidate surname		Other names	
Centre Number		Candidate Number	

Pearson Edexcel Level 1/Level 2 GCSE (9–1)

Monday 9 June 2025

Morning (Time: 1 hour 10 minutes)

Paper reference **1SC0/2BF**

Combined Science

PAPER 4

Foundation Tier

You must have:
Ruler, calculator

Total Marks

Instructions

- Use **black** ink or ball-point pen.
- **Fill in the boxes** at the top of this page with your name, centre number and candidate number.
- Answer **all** questions.
- Answer the questions in the spaces provided
– *there may be more space than you need.*

Information

- The total mark for this paper is 60.
- The marks for **each** question are shown in brackets
– *use this as a guide as to how much time to spend on each question.*
- In the question marked with an **asterisk** (*), marks will be awarded for your ability to structure your answer logically, showing how points that you make are related or follow on from each other where appropriate.

Advice

- Read each question carefully before you start to answer it.
- Try to answer every question.
- Check your answers if you have time at the end.

Turn over ►

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Answer ALL questions. Write your answers in the spaces provided.

Some questions must be answered with a cross in a box ☒. If you change your mind about an answer, put a line through the box ☒ and then mark your new answer with a cross ☒.

- 1 (a) Draw **one** straight line from each hormone to the endocrine gland that produces it.

(2)

hormone

endocrine gland

insulin

pituitary

adrenal

ovaries

oestrogen

testes

pancreas

- (b) Figure 1 shows the concentration of glucose in the blood of a person for a period of six hours.

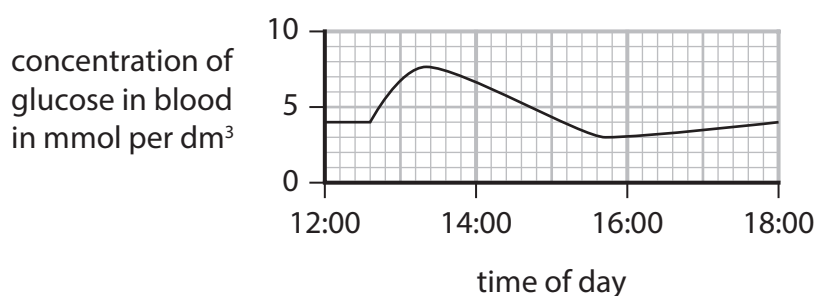


Figure 1

- (i) State the highest blood glucose concentration during this six hour period.

(1)

..... mmol per dm³



(ii) Insulin was released from the pancreas at 13:30.

Describe the changes in the concentration of glucose in the blood from 13:30 to 18:00.

(2)

.....

.....

.....

.....

(c) The cells of people with type 2 diabetes do not respond to insulin.

Describe **two** ways that a person with type 2 diabetes can control the concentration of glucose in their blood.

(2)

1

.....

2

.....

(Total for Question 1 = 7 marks)

.....

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2 Plants produce glucose by photosynthesis.

(a) Complete the word equation for photosynthesis shown in Figure 2.

(2)

water + $\longrightarrow$ glucose +

Figure 2

(b) (i) State why photosynthesis does **not** occur in the roots of plants.

(1)

.....

.....

(ii) Which is transported in the phloem?

(1)

- ☐ **A** starch
- ☐ **B** sucrose
- ☐ **C** urea
- ☐ **D** plasma

(c) Chlorophyll is found in green leaf cells.

Describe the role of chlorophyll in leaf cells.

(2)

.....

.....

.....

.....



(d) A greenhouse contained an oil burning heater.

State **two** ways this could increase the rate of photosynthesis in the greenhouse.

(2)

1

.....

2

.....

(Total for Question 2 = 8 marks)

.....



3 Figure 3 shows part of the nitrogen cycle.

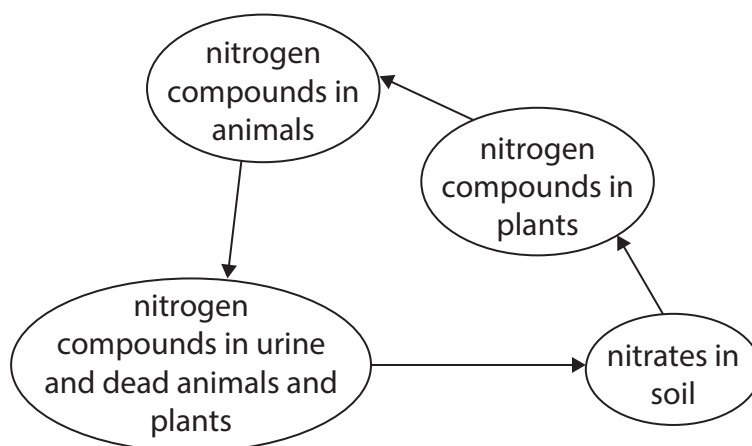


Figure 3

- (a) Use words from the box to complete the following sentences about the nitrogen cycle.

(2)

animals	lipids	decomposers
sugars	proteins	predators

The nitrogen compounds in plants include

The nitrates from rotting dead plants are released into the soil by



- (b) 180 million tonnes of nitrates were used by crops growing on farms in the UK in 2020.

Figure 4 shows the different sources of nitrates used by the crops.

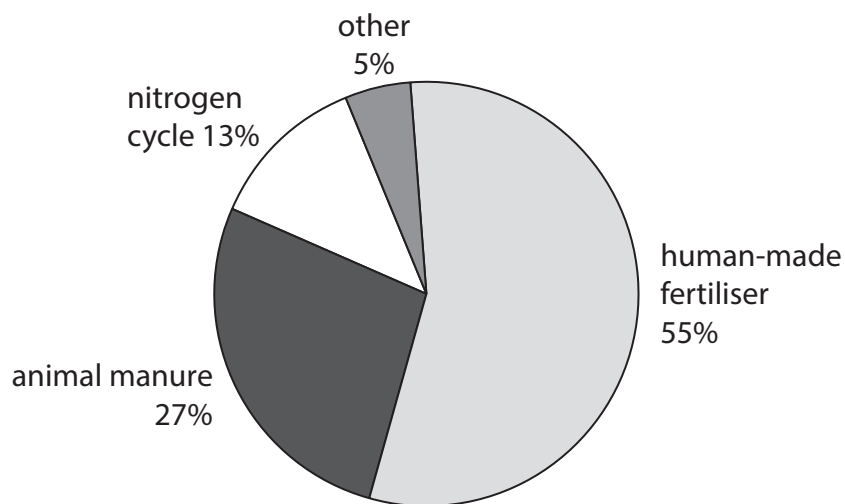


Figure 4

- (i) Calculate the mass of nitrates from human-made fertiliser that was used by crops in 2020.

(2)

..... million tonnes

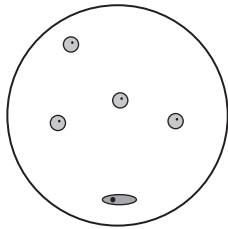
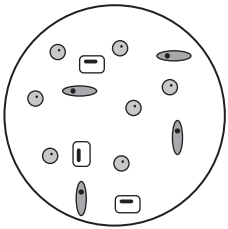
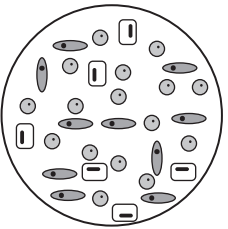
- (ii) Some of the nitrates spread on fields as fertiliser get into lakes.

Name the type of pollution caused by the build-up of nitrates in lakes.

(1)

- (c) A student investigated how the concentration of nitrate affected the types of algae growing in three lakes.

Figure 5 shows microscope images of the algae in 1 mm^3 of water, and the concentrations of nitrate ions in each lake.

	lake X	lake Y	lake Z
microscopic view showing algae in 1 mm^3 of lake water			
concentration of nitrate ions in mols per dm^3	2	5	8

Key to algae

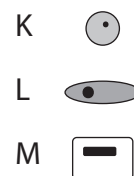


Figure 5

- (i) Figure 6 shows a bar chart for the algae in lakes X, Y and Z.

Complete the bar chart for algae L and algae M in lake Z.

(2)

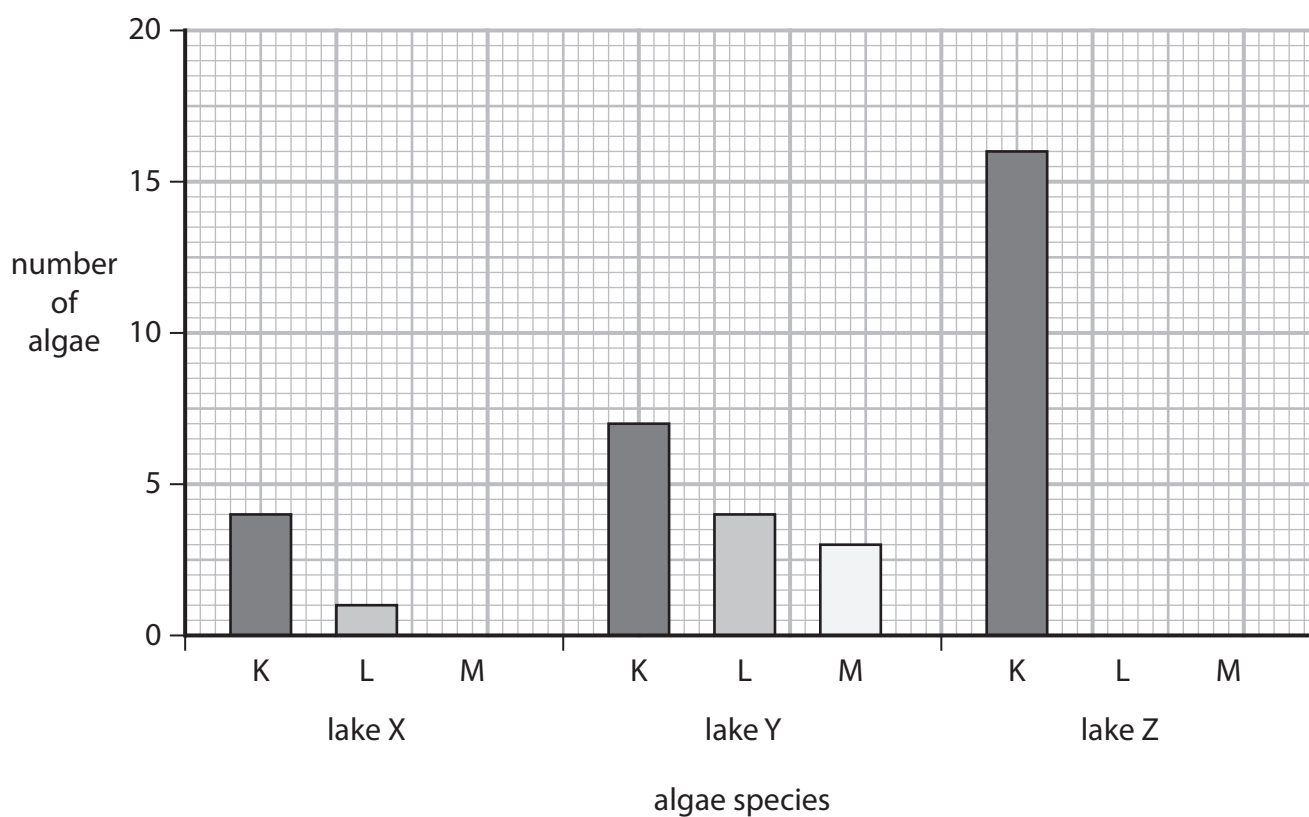


Figure 6

(ii) State **two** conclusions about the relationship between nitrate concentration and the algae in these lakes.

(2)

1

.....

2

.....

(iii) A build-up of algae on the surface of the lake can affect plants growing at the bottom of the lake.

Which statement shows how this would affect the plants at the bottom of the lake?

(1)

- ☐ **A** plants grow faster because they are warmer
- ☐ **B** plants can photosynthesise more
- ☐ **C** plants die as they do not receive enough light
- ☐ **D** plants cannot absorb water

(Total for Question 3 = 10 marks)

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- 4 Figure 7 shows the structure of the human heart and the direction of blood flow.

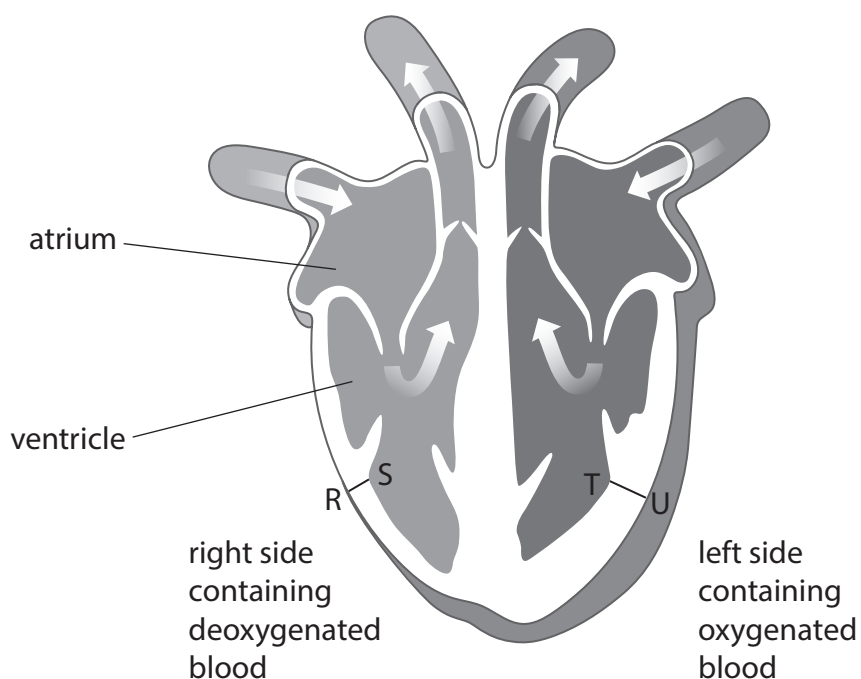


Figure 7

- (a) (i) Measure the thickness of the left ventricle wall between points T and U.

(1)

T-U = mm

- (ii) Describe how deoxygenated blood leaves the right side of the heart and becomes oxygenated.

(2)

.....

.....

.....

.....



(iii) Which blood vessel returns deoxygenated blood to the right side of the heart?

(1)

- ☐ **A** aorta
- ☐ **B** pulmonary artery
- ☐ **C** pulmonary vein
- ☐ **D** vena cava

(b) Figure 7 shows the valves that stop blood from flowing in the wrong direction.

State the number of valves in the right side of the human heart shown in Figure 7.

(1)

(c) The heart is part of the circulatory system.

Describe what happens to the blood when the left ventricle contracts.

(3)

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(d) Figure 8 shows information about three types of blood vessel.

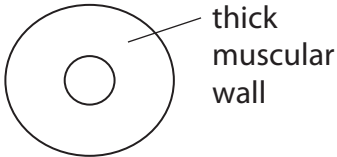
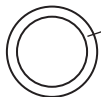
blood vessel	A	B	C
type of blood vessel	artery	capillary	?
cross-section of blood vessel	 thick muscular wall		 thin muscular wall

Figure 8

(i) State the type of blood vessel shown as C in Figure 8.

(1)

(ii) Describe how the structure of a capillary helps gas exchange in the lungs.

(2)

(Total for Question 4 = 11 marks)

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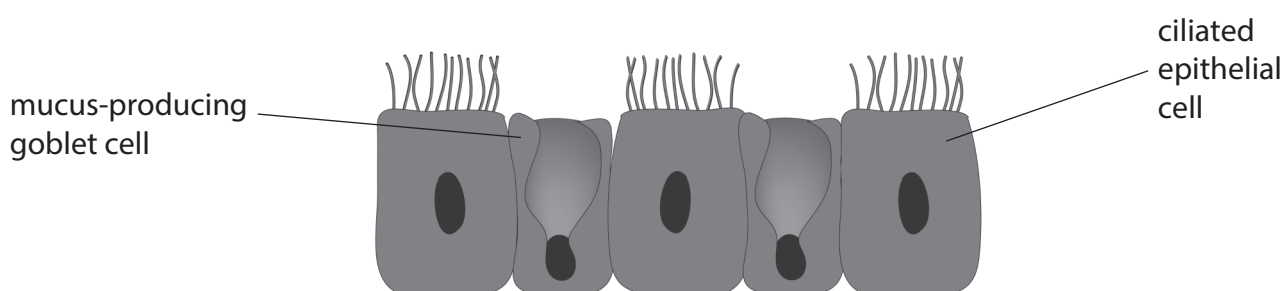
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- 5 (a) Explain why a person's heart rate increases when they are running compared with when they are at rest.

(2)

- (b) Figure 9 shows a diagram of mucus-producing goblet cells and ciliated epithelial cells in the airways of the lungs.



(Source: © K.K.T Madhusanka/Shutterstock)

Figure 9

Describe how pathogens are removed from the airways by ciliated epithelial cells.

(2)

(c) During a race, athletes respire aerobically and anaerobically.

Figure 10 shows an athlete after a race.



(Source: © voronaman/Shutterstock)

Figure 10

Explain how aerobic respiration provides energy for running.

(2)

.....

.....

.....

.....

.....



- (d) The rate of respiration of maggots was investigated using the equipment shown in Figure 11.

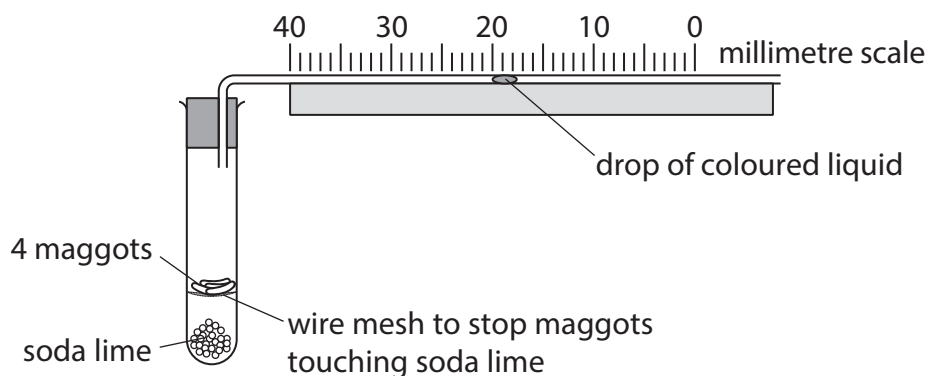


Figure 11

- (i) State the reason why the soda lime is placed in the test tube.

(1)

- (ii) The drop of liquid in Figure 11 is at 20 mm.

The drop of coloured liquid moved at a mean rate of 2 mm per minute.

Draw, on Figure 12, the new position of the bubble after the five minutes.

(1)



Figure 12

(iii) The investigation was repeated with two maggots.

Explain how the movement of the drop of coloured liquid would be affected if the investigation was repeated using fewer maggots.

(2)

(iv) State **one** way this investigation can be improved to obtain more reliable results.

(1)

(Total for Question 5 = 11 marks)

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- 6 (a) In 2018, all the plants were removed from the soil in a 1000 m² area.

A wall was built around this area to keep people out.

In 2019, three species of plants were recorded growing in this area.

Two of these species were indigenous.

- (i) State what is meant by the term 'indigenous'.

(1)

- (ii) Name **one** piece of equipment that could be used to sample the number of indigenous plants in this area.

(1)

- (b) The area was surveyed every year and the number of plants of each species (A to H) was estimated.

Figure 13 shows the results.

estimated number of each plant species found in the survey								
year	A	B	C	D	E	F	G	H
2018	—	—	—	—	—	—	—	—
2019	491	23	66	—	—	—	—	—
2020	664	48	186	1	8	—	—	—
2021	470	25	283	3	6	7	1	—
2022	120	41	354	7	4	11	7	—
2023	44	39	421	21	6	11	9	8

Figure 13



- (i) State the trend shown by the data in Figure 13 for plant species C from 2019 to 2023.

(1)

- (ii) A scientist suggested that the decrease in the number of plants of species B in 2021 was caused by competition from one of the other species of plant.

Which species is most likely to have out-competed species B in 2021?

(1)

- ☐ **A** species A
- ☐ **B** species C
- ☐ **C** species D
- ☐ **D** species H

- (iii) Explain **one** way that this species could have out-competed species B.

(2)

- (iv) Give **one** way that species H could have moved into the area.

(1)

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*(c) Figure 14 shows some plants growing in a small area of a 1000 m² field.



Figure 14

Devise a plan to estimate the number of named plant species growing in this field.

(6)

(Total for Question 6 = 13 marks)

TOTAL FOR PAPER = 60 MARKS

