Please write clearly in block capitals.

Centre number | | | | | | Candidate number | | | | |

Surname _____

Forename(s) _____

Candidate signature _____
I declare this is my own work.

GCSE
COMBINED SCIENCE: TRILOGY

F

Foundation Tier
Biology Paper 2F

Monday 9 June 2025 | Morning | Time allowed: 1 hour 15 minutes

Materials
For this paper you must have:
- a ruler
- a scientific calculator.

Instructions
- Use black ink or black ball-point pen.
- Pencil should only be used for drawing.
- Fill in the boxes at the top of this page.
- Answer **all** questions in the spaces provided.
- If you need extra space for your answer(s), use the lined pages at the end of this book. Write the question number against your answer(s).
- Do all rough work in this book. Cross through any work you do not want to be marked.
- In all calculations, show clearly how you work out your answer.

Information
- The maximum mark for this paper is 70.
- The marks for questions are shown in brackets.
- You are expected to use a calculator where appropriate.
- You are reminded of the need for good English and clear presentation in your answers.

For Examiner's Use	
Question	Mark
1	
2	
3	
4	
5	
6	
TOTAL	

Do not write outside the box

0 1 The concentration of glucose in the blood can be controlled.

0 1 . 1 A person drinks a glucose solution.

What happens to the person's blood glucose concentration soon after drinking the glucose solution?

[1 mark]

Tick (✓) **one** box.

- Blood glucose concentration decreases. ☐
- Blood glucose concentration stays the same. ☐
- Blood glucose concentration increases. ☐

0 1 . 2 Insulin controls blood glucose concentration.

Which organ produces insulin?

[1 mark]

Tick (✓) **one** box.

- Pancreas ☐
- Pituitary ☐
- Stomach ☐

Do not write outside the box

0 1 . 3 Organs affected by insulin are called target organs.

Which **two** organs are target organs for insulin?

[2 marks]

Tick (✓) **two** boxes.

Liver ☐

Lung ☐

Muscle ☐

Ovary ☐

Spinal cord ☐

0 1 . 4 Complete the sentences.

Choose answers from the box.

[2 marks]

DNA	**glucose**	**glycogen**	**urea**

Insulin causes cells to take in _____.

The storage molecule made inside the cells is _____.

Question 1 continues on the next page

Do not write outside the box

0 1 . 5 Complete the sentence.

Choose the answer from the box.

[1 mark]

increase	**stay the same**	**decrease**

Insulin causes blood glucose concentration to _____.

0 1 . 6 Type 2 diabetes is caused when the body cells no longer respond to insulin.

Give **two** ways to reduce the risk of developing Type 2 diabetes.

Do **not** refer to insulin in your answer.

[2 marks]

1 _____

_____

2 _____

_____

9

Do not write outside the box

0 2 Farmers can increase crop yield by controlling the conditions that plants grow in.

0 2 . 1 Draw **one** line from each substance to how the substance increases crop yield.

[2 marks]

Substance	How the substance increases crop yield
	Adds mineral ions to the soil
Fertiliser	Decreases carbon dioxide concentration in the soil
Herbicide	Increases oxygen concentration in the air
	Kills weeds that compete with crops

0 2 . 2 **Figure 1** shows a food chain for a farmer's field.

Figure 1

Seeds → Mice → Owls

Which is the secondary consumer in the food chain?

[1 mark]

Tick (✓) **one** box.

Seeds ☐

Mice ☐

Owls ☐

Do not write outside the box

0 2 . 3 Bees are insects that live in hives.

The bees fly in and out of the hives.

Figure 2 shows a crop growing in a field.

The farmer has added bee hives to increase the number of bees in the field.

Figure 2

Increasing the number of bees and other insects increases crop yield.

Which are **two** ways that increasing the number of insects in an area will increase crop yield?

[2 marks]

Tick (✓) **two** boxes.

Insects change the soil pH around the crop. ☐

Insects eat leaves from the crop. ☐

Insects eat pests on the crop. ☐

Insects pollinate the crop. ☐

Insects shelter in the crop. ☐

Do not write outside the box

0 2 . 4 Some farmers increase the size of hedgerows between fields where crops grow.

Suggest **one** reason why.

[1 mark]

Peat comes from peat bogs.

0 2 . 5 Peat can be used to produce garden compost.

Table 1 compares peat compost with a sample of soil.

Table 1

	Mineral ion concentration	**Speed at which water drains through**
Peat compost	Low	Slow
Soil	High	Fast

Young plants have short roots.

Explain **one** advantage of growing young plants in peat compost instead of in soil.

[2 marks]

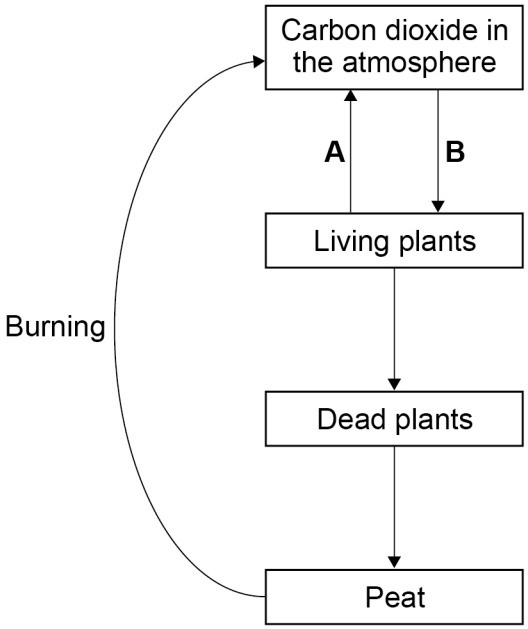
Question 2 continues on the next page

Do not write outside the box

Peat can also be burnt as fuel.

Figure 3 shows part of the carbon cycle.

Figure 3



0 2 . 6 Name process **A** and process **B**.

Choose answers from the box.

[2 marks]

condensation	**photosynthesis**	**respiration**	**transpiration**

Process **A** _____

Process **B** _____

Do not write outside the box

0 2 . 7 Peat contains carbon compounds.

Explain why burning peat contributes to climate change.

[2 marks]

0 2 . 8 Decay is an important process in the carbon cycle.

Which **two** types of organism cause decay?

[2 marks]

Tick (✓) **two** boxes.

Algae ☐

Animals ☐

Bacteria ☐

Fungi ☐

Plants ☐

0 2 . 9 Deforestation affects the carbon cycle.

Give **one** use of the land after the land has been cleared by deforestation.

[1 mark]

15

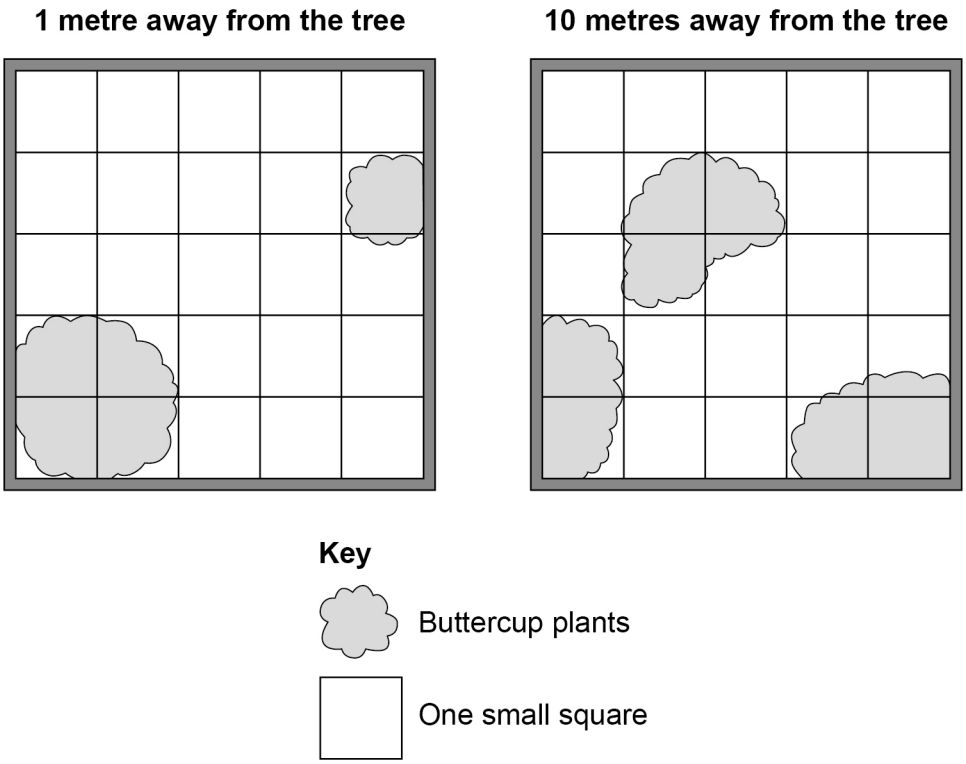
Do not write outside the box

0 3 Buttercups are small plants.

A student investigated the distribution of buttercup plants at different distances from a tree.

Figure 4 shows a piece of equipment being used to sample two areas.

Figure 4



0 3 . 1 What is the scientific name of the equipment shown in **Figure 4**?

[1 mark]

Tick (✓) **one** box.

Grid ☐

Quadrat ☐

Transect ☐

Do not write outside the box

0 3 . 2 Each small square on **Figure 4** represents a percentage cover of 4%.

The student counted every small square that was **at least half** covered by buttercup plants.

At 1 metre away from the tree, buttercup plants had a percentage cover of 20%.

Determine the percentage cover of buttercup plants at **10 metres** away from the tree.

Use **Figure 4**.

[2 marks]

_____

_____

_____

Percentage cover = _____ %

0 3 . 3 What is the independent variable in the investigation?

[1 mark]

Tick (✓) **one** box.

Distance from the tree ☐

Number of species ☐

Time of year ☐

0 3 . 4 What is an advantage of calculating percentage cover instead of counting the number of buttercup plants in an area?

[1 mark]

Tick (✓) **one** box.

Percentage cover is affected by the number and size of individual plants. ☐

Percentage cover is always the same for individual plants of any species. ☐

Percentage cover is larger than the number of individual plants. ☐

Do not write outside the box

The student investigated the percentage cover of buttercup plants around a different tree.

Table 2 shows the results.

Table 2

Distance from the tree in metres	Percentage (%) cover					
	Result 1	**Result 2**	**Result 3**	**Result 4**	**Result 5**	**Mean**
1	12	8	4	12	4	**X**
10	24	12	8	28	8	16

0 3 . 5 Calculate mean value **X** in **Table 2**.

[2 marks]

_____

_____

_____

X = _____ %

0 3 . 6 Give **one** conclusion about the effect of distance from the tree on the percentage cover of buttercup plants.

Use **Table 2**.

[1 mark]

_____

_____

Do not write outside the box

0 3 . 7 Give **two** other factors that affect the percentage cover of buttercup plants around the tree.

Do **not** refer to distance from the tree.

[2 marks]

1 _____

_____

2 _____

_____

0 3 . 8 **Table 2** shows the results of the investigation.

Suggest **two** improvements to the investigation.

[2 marks]

1 _____

_____

2 _____

_____

12

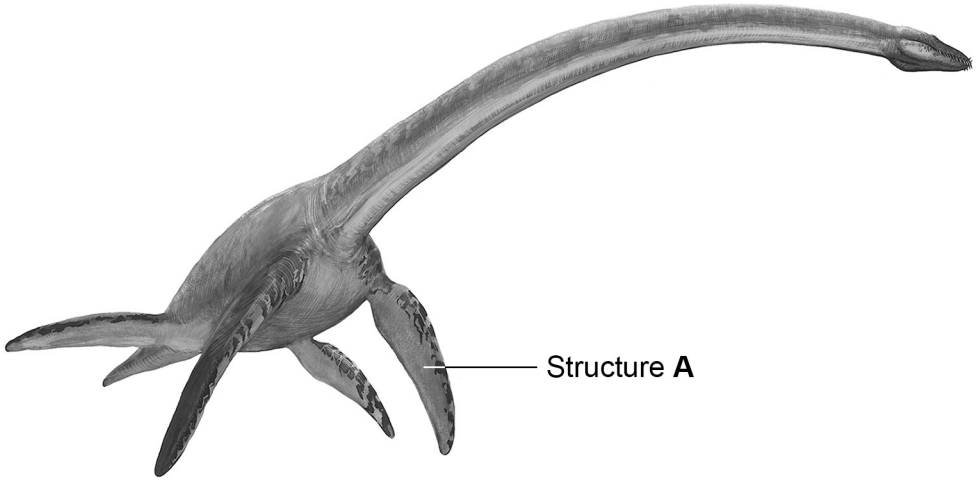
Turn over for the next question

Do not write outside the box

0 4 Plesiosaurs are extinct animals that lived in the ocean.

Figure 5 shows what scientists think a living plesiosaur may have looked like.

Figure 5



0 4 . 1 Scientists think that the plesiosaur had smooth skin.

Suggest why the scientists **cannot** be certain what the skin of the plesiosaur was like.

[1 mark]

0 4 . 2 Explain how structure **A** in **Figure 5** helped the plesiosaur survive in the ocean.

[2 marks]

Do not write outside the box

0 4 . 3 Plesiosaurs may have moved rapidly upwards to hold their heads above the water surface to search for prey.

What type of adaptation was the rapid upwards movement?

[1 mark]

Tick (✓) **one** box.

Behavioural ☐

Chemical ☐

Structural ☐

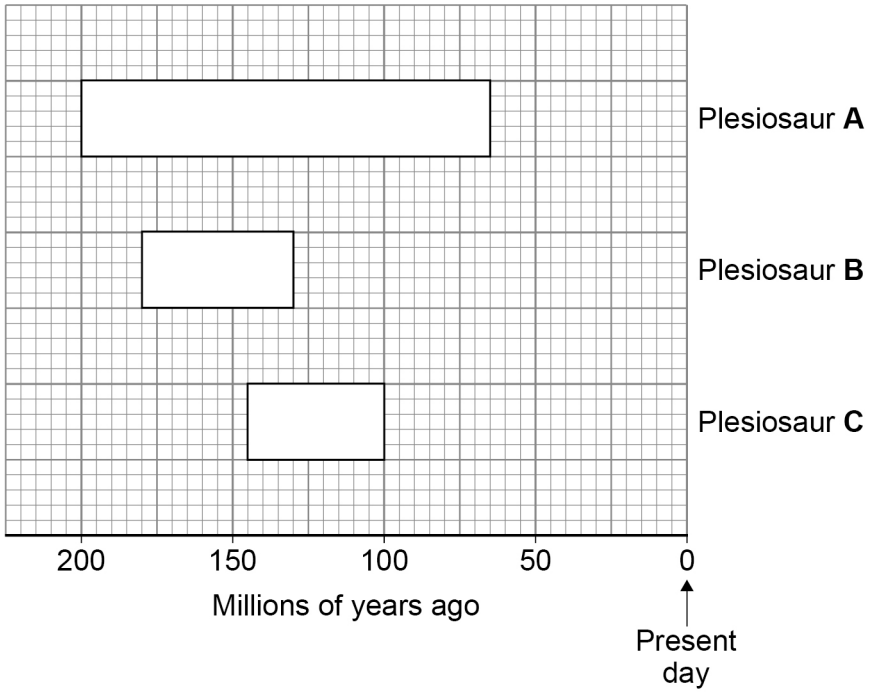
Question 4 continues on the next page

Do not write outside the box

Scientists use fossils to estimate when different types of plesiosaur existed.

Figure 6 shows when three types of plesiosaur existed.

Figure 6



0 4 . 4 When did plesiosaur **A** first evolve?

Use **Figure 6**.

[1 mark]

_____ million years ago

0 4 . 5 Determine how many million years plesiosaur **B** existed for.

Use **Figure 6**.

[2 marks]

_____

_____

_____

Time = _____ million years

Do not write outside the box

0 4 . 6 The exact year of extinction of all plesiosaur species can only be estimated.

Which are **two** reasons why?

[2 marks]

Tick (✓) **two** boxes.

All plesiosaurs will have formed fossils. ☐

Not all plesiosaur fossils have been discovered. ☐

Plesiosaur bones do not decay. ☐

Plesiosaurs had many predators. ☐

Some plesiosaur fossils will have been destroyed. ☐

0 4 . 7 What evidence from **Figure 6** shows that plesiosaur **C** might have evolved from plesiosaur **B**?

[1 mark]

Tick (✓) **one** box.

Plesiosaur **B** and plesiosaur **C** did not exist at the same time. ☐

Plesiosaur **B** existed before plesiosaur **C**. ☐

Plesiosaur **B** became extinct more recently than plesiosaur **C**. ☐

Question 4 continues on the next page

Do not write outside the box

0 4 . 8 Evolution can be studied using evidence from:

- fossils
- antibiotic-resistant bacteria.

Suggest **two** reasons why it is easier to study evolution in bacteria than to study evolution using fossils.

[2 marks]

1 _____

_____

2 _____

_____

0 4 . 9 Give **one** reason why doctors are concerned about antibiotic-resistant bacteria.

[1 mark]

_____

_____

13

Do not write outside the box

0 5 This question is about genetics.

The fur colour of rabbits is controlled by two alleles.

0 5 . 1 Draw **one** line from each term to the meaning of the term relating to genetics in rabbits.

[3 marks]

Term	Meaning of the term
Chromosome	A fur colour that is seen
Gene	A whole strand of DNA found in the nucleus of a rabbit cell
Genome	Codes for a protein that affects fur colour
	The complete genetic composition of a rabbit

Question 5 continues on the next page

Do not write outside the box

0 5 . 2 In rabbits:

- the allele for brown fur (**B**) is dominant
- the allele for white fur (**b**) is recessive.

A rabbit with the alleles **Bb** and a rabbit with the alleles **bb** breed together.

Determine the probability that one of the offspring will have white fur.

You should:

- complete the Punnett square diagram
- identify any offspring that will have white fur.

[5 marks]

Probability = _____

Do not write outside the box

0 5 . 3 A male rabbit is heterozygous for fur colour.

The rabbit's body cells have the genotype **Bb**.

One of the sperm cells from the rabbit has the allele **b**.

Explain why the alleles in the rabbit's body cells and the allele in the sperm cell are different.

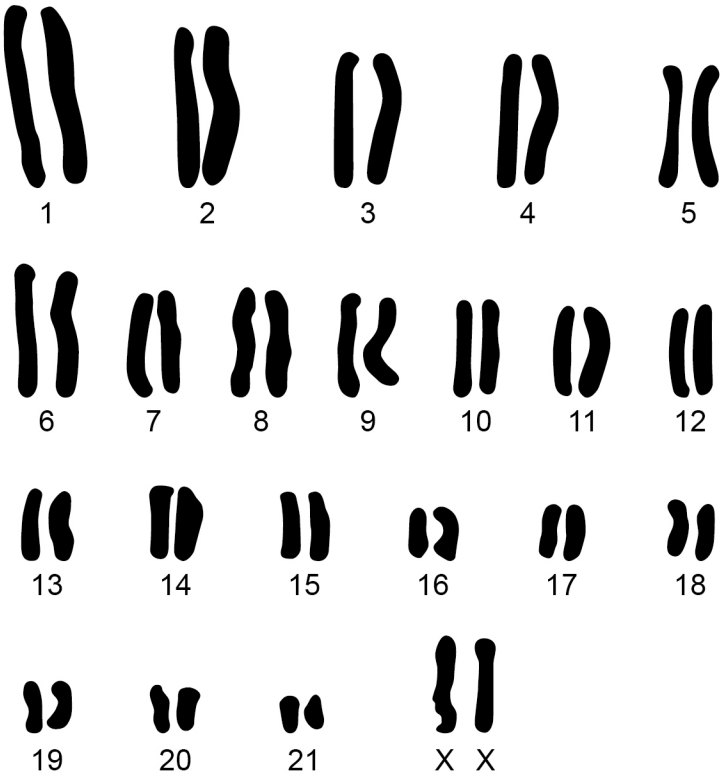
[2 marks]

Question 5 continues on the next page

Do not write outside the box

Figure 7 shows the chromosomes of a rabbit.

Figure 7



0 5 . 4 How many chromosomes would be found in a skin cell of a rabbit?

Use **Figure 7**.

[1 mark]

Number of chromosomes = _____

0 5 . 5 The sex of a rabbit is controlled in the same way as the sex of a human.

Give the evidence from **Figure 7** that the rabbit is female.

[1 mark]

_____

_____

12

Do not write outside the box

0 6 This question is about the hormones involved in reproduction.

0 6 . 1 Name **one** hormone produced in the **ovaries**.

[1 mark]

0 6 . 2 Give **one** function of the hormone that is produced in the **testes**.

[1 mark]

Different methods of contraception can involve:

- barriers
- hormones.

0 6 . 3 Condoms are a barrier method of contraception.

Give **one** advantage of condoms as a method of contraception compared with hormonal methods of contraception.

Do **not** refer to cost in your answer.

[1 mark]

Question 6 continues on the next page

Do not write outside the box

0 6 . 4 Describe how **hormones** are used in different methods of contraception.

[6 marks]

Extra space

9

END OF QUESTIONS

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ANSWER IN THE SPACES PROVIDED

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Question number	**Additional page, if required.** **Write the question numbers in the left-hand margin.**

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