



General Certificate of Secondary Education
2024–2025

Centre Number

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Candidate Number

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Single Award Science: Biology

Unit 1



Foundation Tier

[GSA11]

GSA11

TUESDAY 13 MAY 2025, AFTERNOON

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.

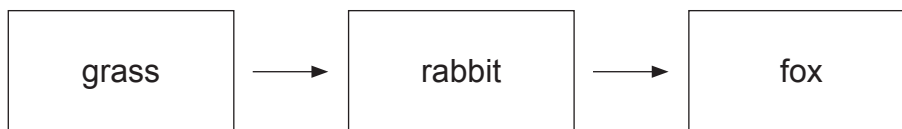
Quality of written communication will be assessed in Question **9(b)**.

14846



20GSA1101

- 1 (a) The diagram below shows a simple food chain.



- (i) Name the producer in this food chain.

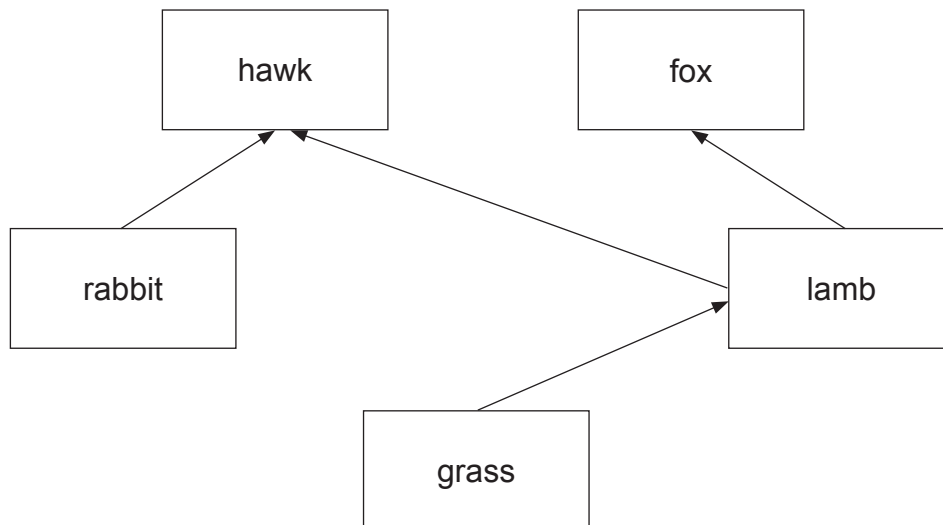
_____ [1]

- (ii) Name the original source of energy for this food chain.

_____ [1]

Food webs are made up of many food chains linked together.

- (b) Complete the food web below by adding **arrows** to show the food chain from part (a).



[1]



(c) Complete the following sentence about the food web opposite.

Choose from:

increase : decrease : stay the same

less : more : the same number of

If the number of lambs decrease, the number of rabbits will

_____ because the hawks will eat

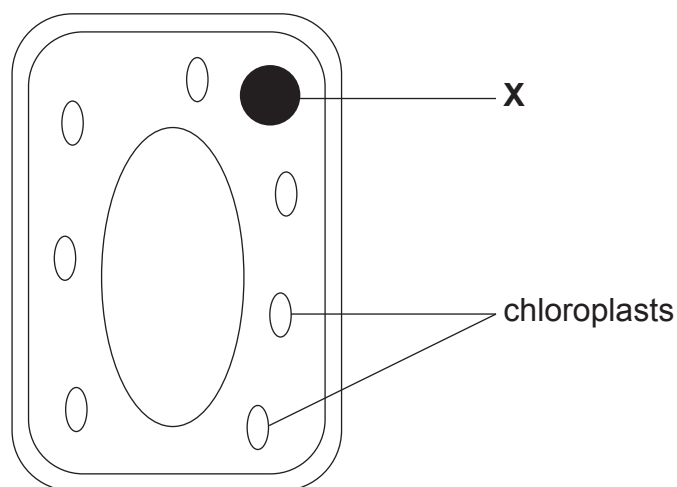
_____ rabbits.

[2]

[Turn over



- 2 (a) The diagram below shows some structures present in a plant cell.



- (i) Name the structure labelled X.

_____ [1]

- (ii) Give the function of the structure labelled X.

Circle your answer.

provides support to the cell

contains cell sap

control centre of the cell

[1]

Chloroplasts are structures found in plant cells that are **not** found in animal cells.

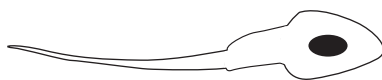
- (iii) Name **one other** structure, shown in the diagram above, that is found in plant cells but not in animal cells.

_____ [1]



(b) The diagrams below show a sperm cell and an egg cell.

sperm cell



egg cell



(i) Name the part of the male reproductive system that produces sperm cells.

_____ [1]

(ii) Name the part of the female reproductive system that produces egg cells.

_____ [1]

(iii) Name **one** method of contraception that prevents sperm cells from entering the female reproductive system.

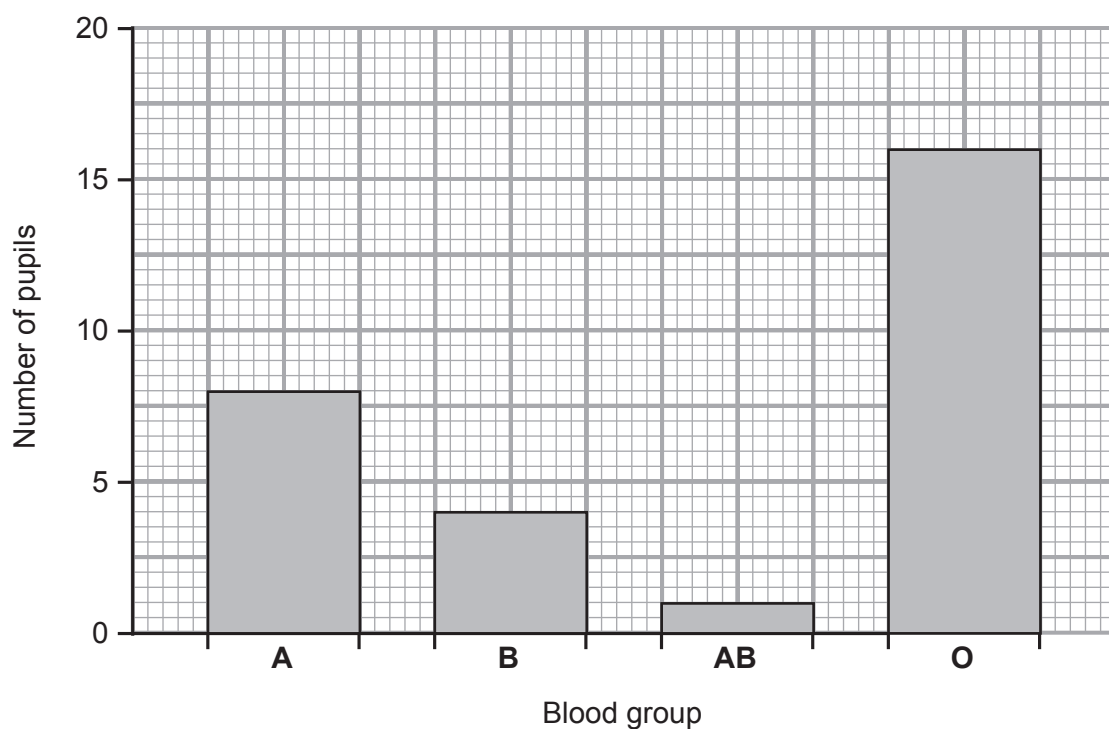
_____ [1]

[Turn over



- 3 (a) There are four blood groups in humans, **A**, **B**, **AB** and **O**.

The bar chart below shows the blood groups of pupils in a class.



- (i) Calculate the **total** number of pupils in the class.

_____ [1]

- (ii) How many **more** pupils are there in blood group **O** than in blood group **AB**?

_____ [1]



(b) Blood groups are an example of discontinuous variation.

(i) Complete the sentence below.

Choose from:

many : small : separate : in between

Blood groups are an example of discontinuous variation because the population can be divided into a _____ number of groups with no _____ values. [2]

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

_____ [1]

[Turn over

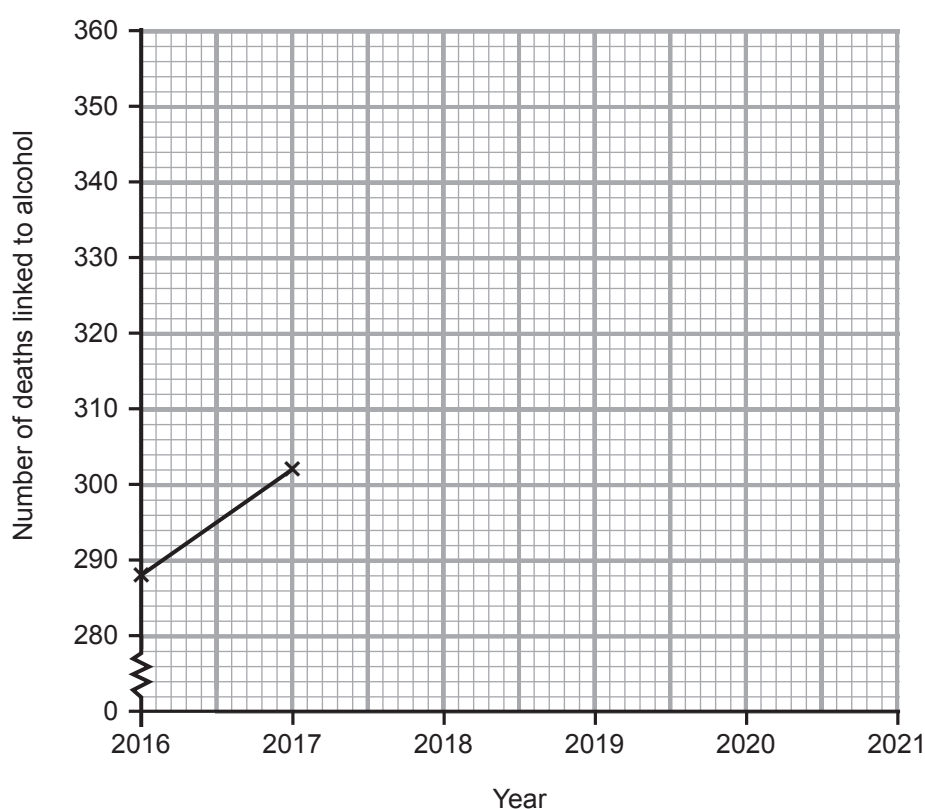


4 (a) Health can be affected by drinking alcohol.

The table below shows the number of deaths linked to alcohol in Northern Ireland from 2016 to 2021.

Year	Number of deaths linked to alcohol
2016	288
2017	302
2018	284
2019	336
2020	350
2021	352

- (i) On the grid below, plot and draw a line graph using this data. The first two points have been plotted for you.



[3]



- (ii) Complete the following sentence to describe the **overall** trend shown by the graph.

As the years increase _____
_____ [1]

- (b) Describe what is meant by binge drinking.

_____ [2]

- (c) One stage in making beer involves soaking barley grains in warm water so that the starch in the barley is converted into sugar.

A reagent can be used to show if any starch is still present in the barley.

- (i) Name the reagent used to test for **starch**.

Choose from:

Benedict's

Biuret

iodine

_____ [1]

- (ii) Give the colour change of this reagent **if starch is still present** in the barley.

from _____ to _____ [2]

[Turn over



- 5 Two pupils, **X** and **Y**, carried out an investigation into the effect of exercise on their pulse rates.

The steps below describe their method.

The steps are **not** in the correct order.

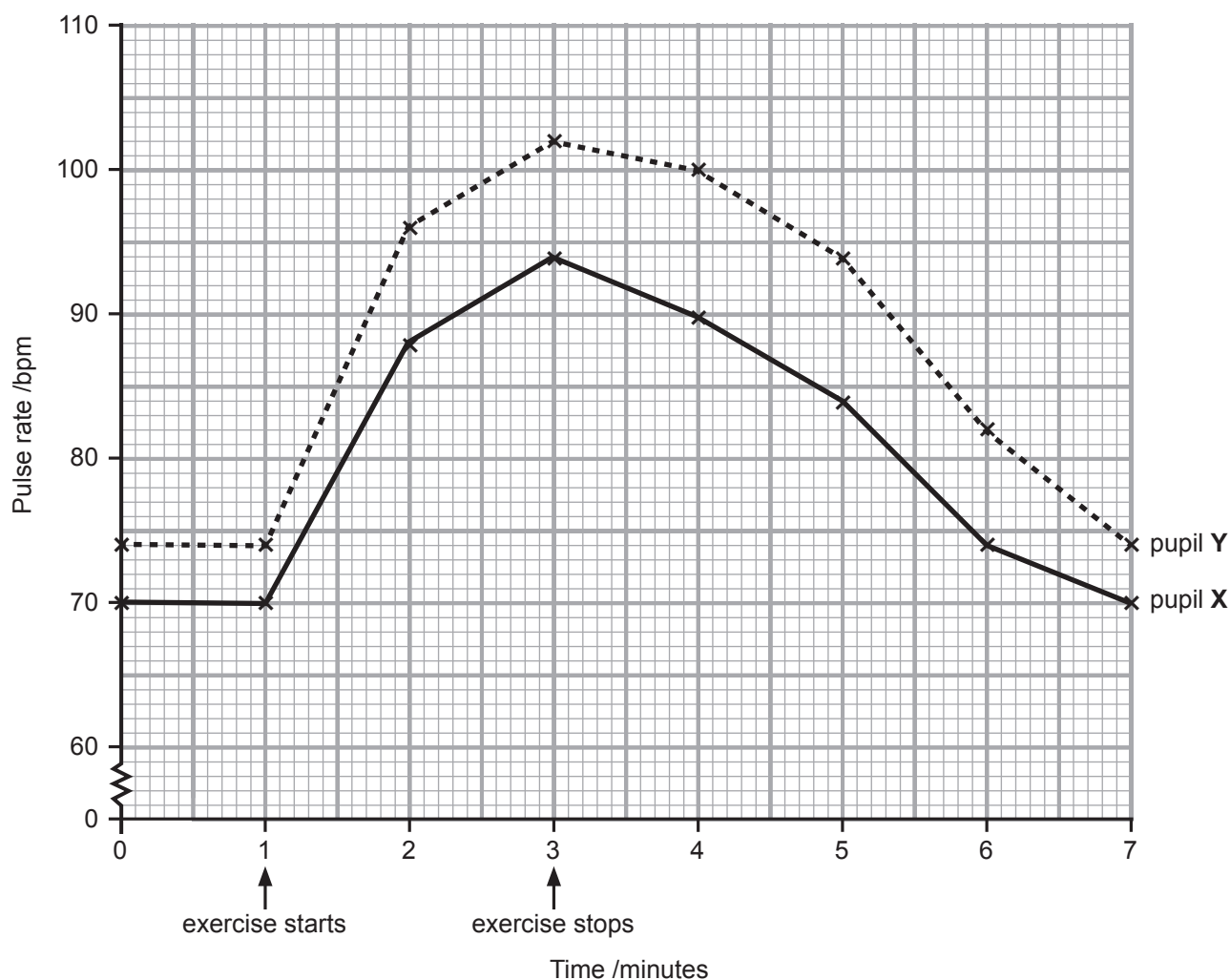
- A** plot a graph of these results
- B** exercise for 2 minutes, recording your pulse rate after each minute
- C** continue to record your pulse rate each minute for 4 minutes after you stop exercising
- D** record your resting pulse rate at 0 minutes and 1 minute

(a) Use the letters, **A**, **B**, **C**, and **D**, to put the steps in the correct order.

_____ → _____ → _____ → _____

[2]

(b) The graph below shows the pupils' results.



(i) What is the highest pulse rate for pupil **X**?

_____ bpm [1]

(ii) Give **one** difference between the pulse rates of pupil **X** and pupil **Y**.

_____ [1]

Respiration increases during exercise.

(c) Complete the word equation below for respiration.

oxygen + → + water + energy
[2]



6 (a) Antibiotics are chemicals produced by fungi.

(i) Name the scientist who discovered the first antibiotic.

_____ [1]

(ii) Name the **type** of microorganism affected by antibiotics.

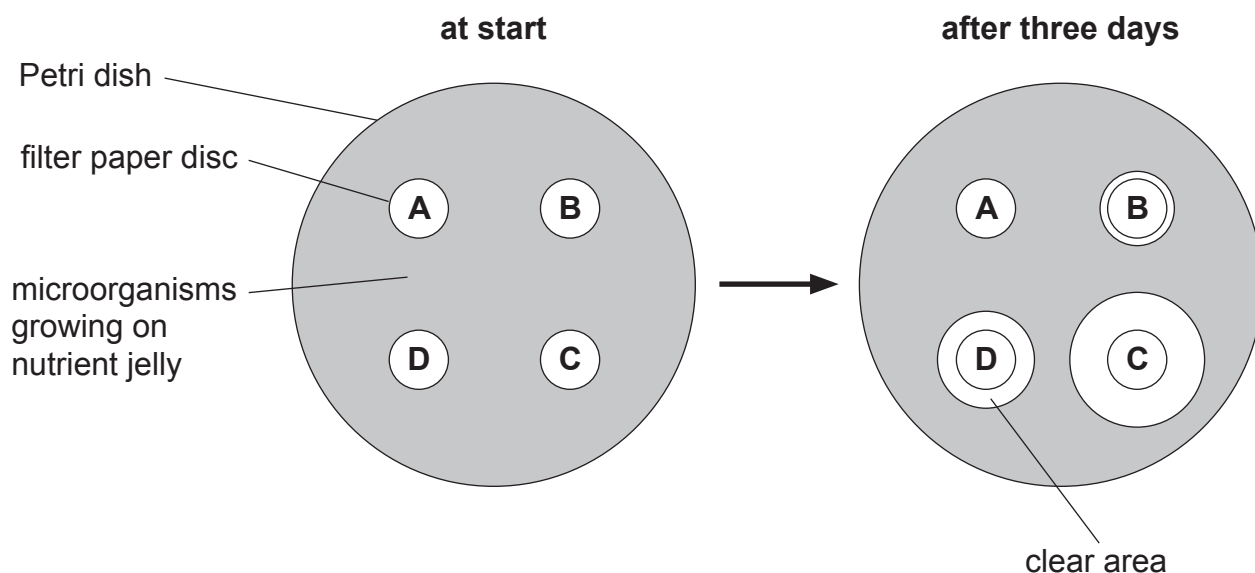
_____ [1]

(b) A scientist carried out an investigation into the effect of three different antibiotics on the growth of one type of microorganism.

The method he used is given below.

1. Soak a filter paper disc in the first antibiotic.
2. Repeat step 1 for the other two antibiotics.
3. Soak another filter paper disc in water.
4. Place the four filter paper discs on a Petri dish containing the microorganisms growing on nutrient jelly.
5. Leave the Petri dish for three days at 25 °C.

The diagram below shows the Petri dish at the start and after three days at 25 °C.



- (i) Suggest which filter paper disc was soaked in the **most effective** antibiotic.
Explain your answer.

Filter paper disc _____

Explanation _____
_____ [2]

- (ii) Suggest which filter paper disc was soaked in water.
Explain your answer.

Filter paper disc _____

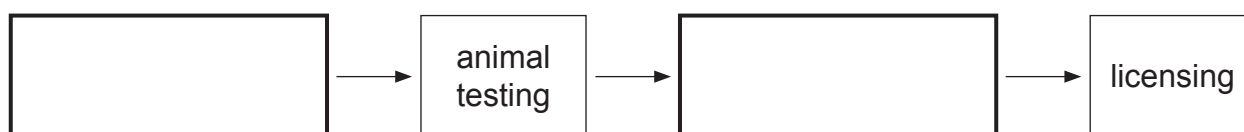
Explanation _____
_____ [2]

- (iii) Describe **one** way the scientist made this investigation a valid (fair) test.

_____ [1]

When a new drug, such as an antibiotic, is developed it must be tested before it can be licensed for use.

- (c) Fill in the empty boxes below to show the stages the drug must go through before it can be licensed for use.

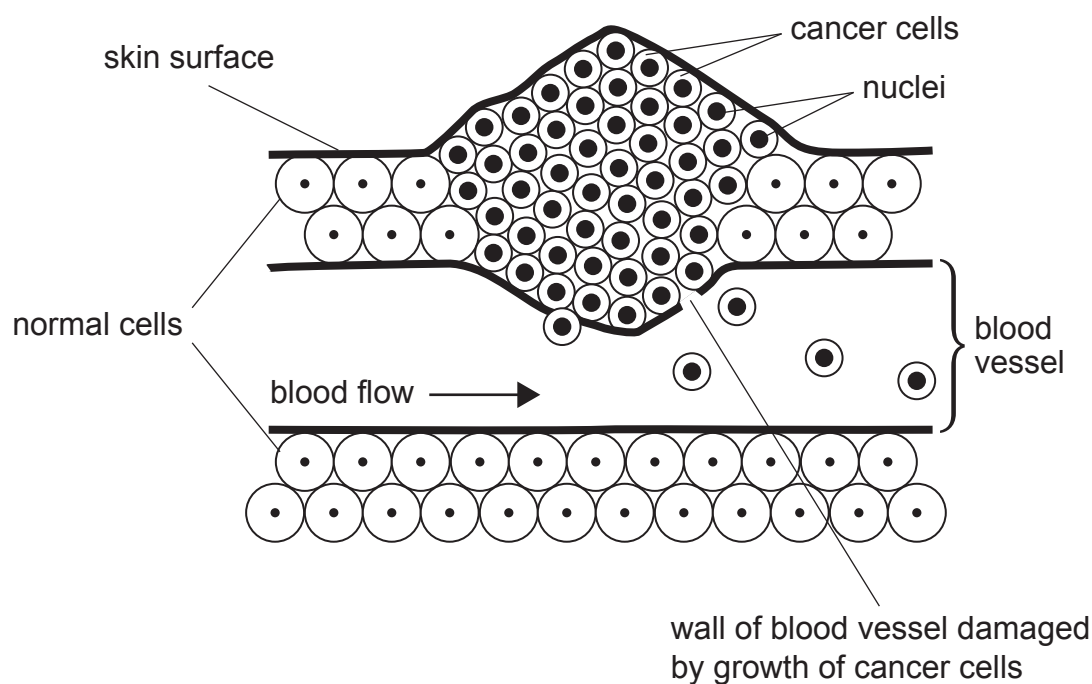


[2]

[Turn over



- 7 The diagram below shows cancer cells growing at the surface of the skin.



- (a) How are cancer cells produced?

_____ [1]

- (b) Use the diagram above to give **two** differences between cancer cells and normal cells.

1. _____

2. _____

_____ [2]



A tumour is a clump of cells.
There are two types of tumour, benign and malignant.
Benign tumours do not spread.
Malignant tumours can spread throughout the body.

- (c) Suggest which type of tumour is shown in the diagram opposite.
Explain your answer.

[1]

- (d) Name the environmental factor which can cause skin cancer.

[1]

[Turn over



- 8 A scientist investigated the effect of planting density (number of seeds planted per square metre) on the average number of tomatoes on each plant.

Table 1 shows her results.

Table 1

Planting density /number of seeds per square metre	Average number of tomatoes on each plant
16	120
20	76
24	40

- (a) Describe and explain how the planting density affected the average number of tomatoes on each plant.

[3]

- (b) The scientist carried out another investigation using a different type of tomato seed which produced plants with larger leaves.

She planted the seeds at a planting density of 16 seeds per square metre.

Table 2 shows her results.

Table 2

Planting density /number of seeds per square metre	Average number of tomatoes on each plant
16	160



- (i) Use Table 1 and Table 2 to calculate the **percentage increase** in the average number of tomatoes on each plant at a planting density of 16 seeds per square metre.

Show your working out.

_____ % [2]

- (ii) The scientist noticed that each tomato was larger on the plant with the larger leaves. Suggest why.

_____ [2]

[Turn over



9 (a) Insulin is an example of a hormone. What is a hormone?

[2]

[2]

(b) Describe and explain the effect of insulin on blood glucose levels in the body.

Your answer should include:

- the name of the organ that produces insulin;
- the name of the target organ for insulin;
- an explanation of the effects of insulin; and
- the condition that occurs when this blood glucose control mechanism fails.

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

[illegible]



[6]

THIS IS THE END OF THE QUESTION PAPER



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Question 2(b) Principal Examiner
Question 3(a) Principal Examiner
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Question 7 Principal Examiner

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Question Number	Marks
1	
2	
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Total Marks	
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Examiner Number

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