



Rewarding Learning

General Certificate of Secondary Education
2020–2021

Centre Number

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Candidate Number

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Single Award Science: Biology

Unit 1
Foundation Tier

MV18

[GSA11]

MONDAY 23 NOVEMBER 2020, MORNING

Time

1 hour, plus your additional time allowance.

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 on blank pages.

Complete in black ink only.

Answer **all nine** questions.

Information for Candidates

The total mark for this paper is 60.

Figures in brackets printed at the end of each question indicate the marks awarded to each question or part question.

Quality of written communication will be assessed in Question 9.

1 Living organisms are made up of cells.

(a) Using lines link each part of the cell to **one** function.
[2 marks]

Part of cell

nucleus

cytoplasm

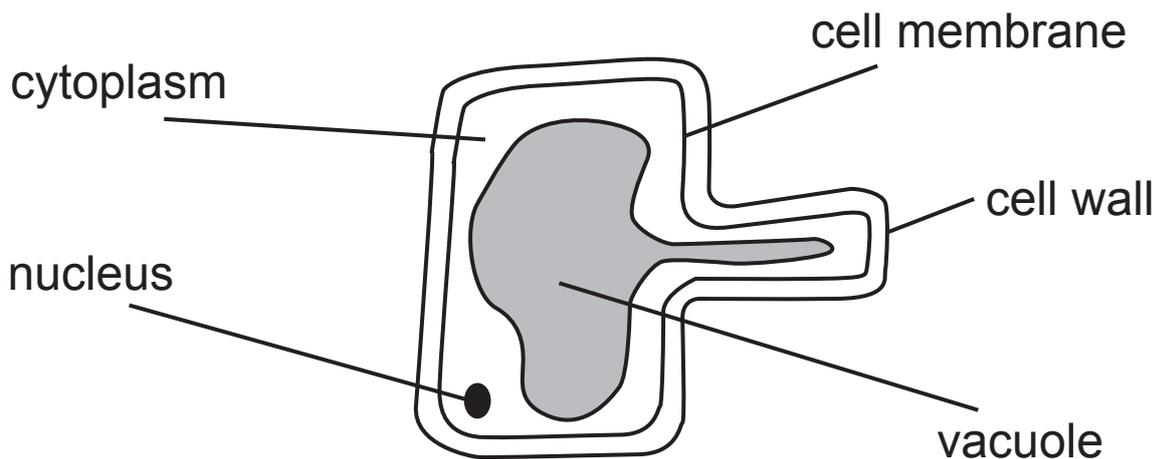
Function

forms a boundary to the cell

control centre of the cell

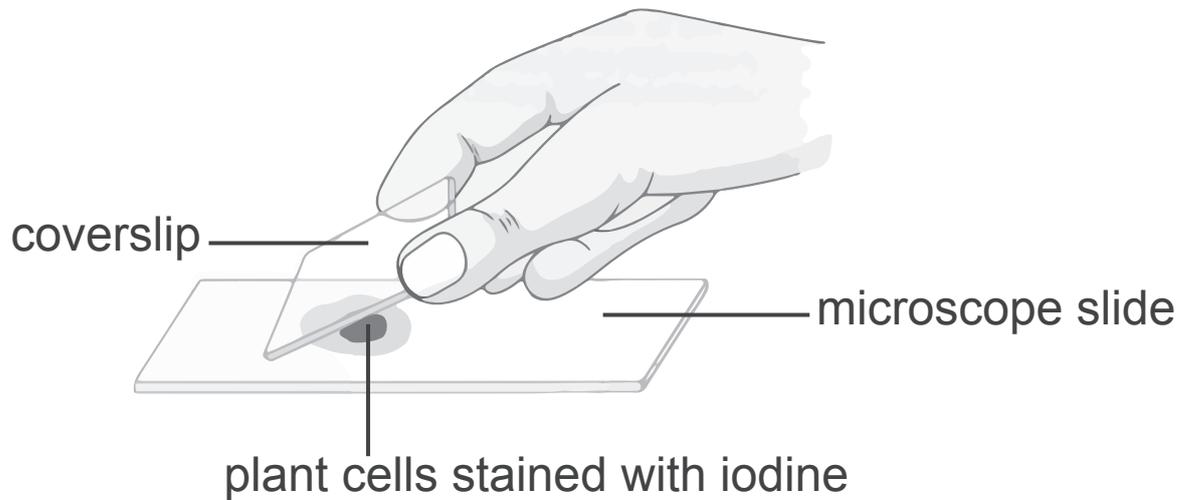
chemical reactions take place here

The diagram below shows a root hair cell.



(b) From the diagram name one part that is **only** found in a plant cell. [1 mark]

(c) The diagram below shows one step in the preparation of a microscope slide of plant cells.



(i) Suggest **one** reason why the plant cells are stained with iodine. [1 mark]

(ii) Suggest **one** reason why a coverslip is placed on the plant cells. [1 mark]

(d) Complete the sentence below about stem cells.
[2 marks]

Choose from:

grow

divide

the same

a different

A stem cell is described as a simple cell in plants and animals which has the ability to _____ to form cells of _____ type.

2 (a) Foods of different types make up a healthy diet.

(i) Complete the table below. [2 marks]

Choose from:

milk

carbohydrates

fat

wholemeal bread

Food type	Source
fibre	
	butter

Food tests are used to identify the food types present in different foods.

(ii) Which reagent is used to test for the presence of starch in food? [1 mark]

Circle your answer.

iodine

biuret

ethanol

(b) Food can also provide us with energy.

Complete the sentences below. [2 marks]

Choose from:

heat

digestion

respiration

chemical

Food is a source of _____ energy. The process that releases energy from food in all cells is _____ .

(c) The amount of energy a person needs can depend on how active they are.

(i) Give **one** other factor that could affect how much energy a person needs. [1 mark]

The table below shows the energy values of the different foods in two meals.

Meal 1		Meal 2	
Food	Energy (kJ)	Food	Energy (kJ)
boiled potatoes	520	chips	1300
hamburger	1000	baked cod	500
fruit juice	30	cake	400

(ii) Suggest which meal (**1** or **2**) a person should eat if they do **not** want to gain any weight. Explain your choice. [1 mark]

Meal _____

Explanation _____

- 3 (a) The diagram below shows the organisms in a simple food chain.



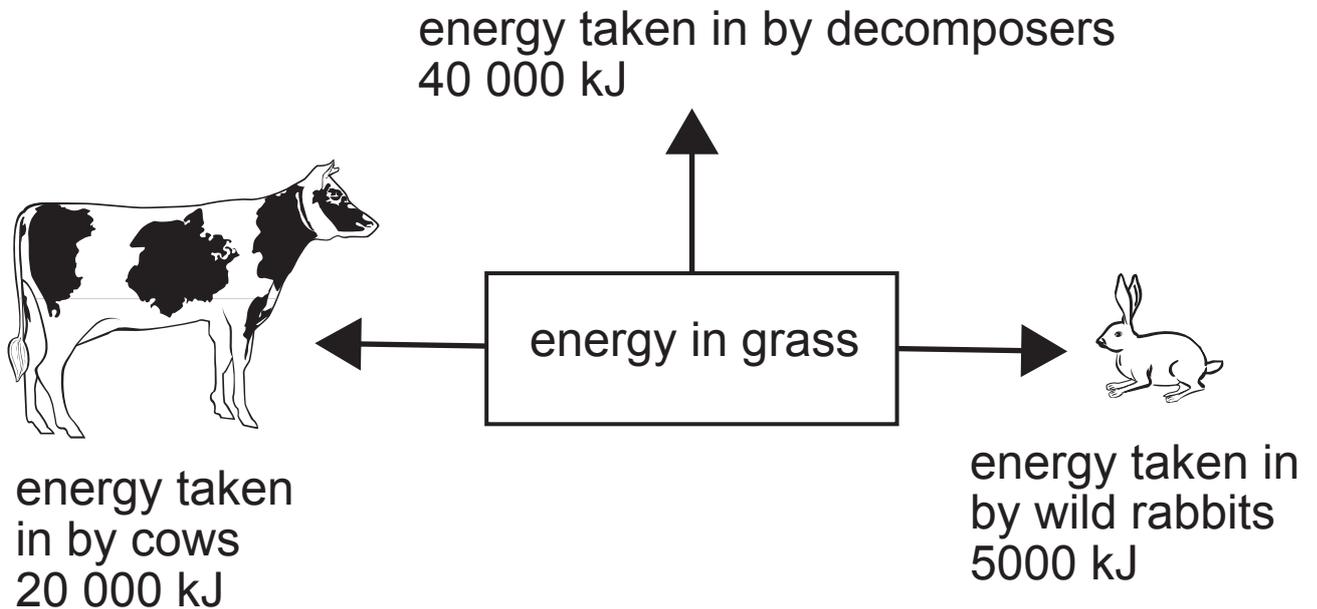
- (i) Add arrows to the diagram to show the direction of energy flow. [1 mark]

- (ii) Name the **secondary consumer** in this food chain. [1 mark]

- (b) What is the original source of energy for all food chains? [1 mark]

- (c) Describe the role of the **producer** in a food chain. [1 mark]

(d) A farmer uses the grass in one of his small fields to feed his cows. There are also wild rabbits in this field. The diagram below shows how all the energy in the grass is used.



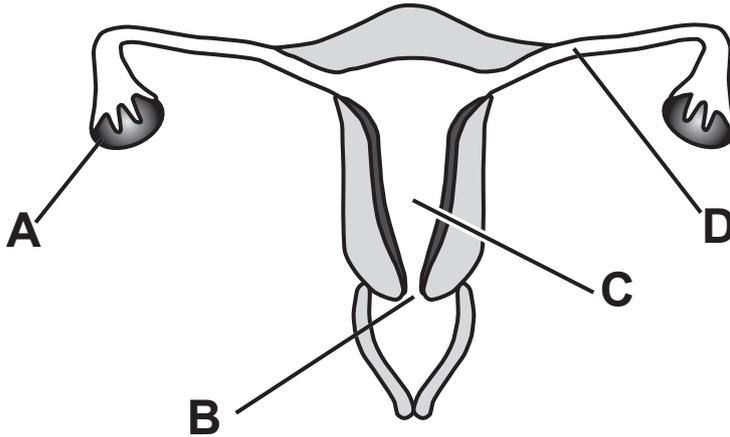
(i) Calculate the amount of energy that was contained in this area of grass. [1 mark]

_____ kJ

(ii) Suggest **one** benefit to the farmer if there were no rabbits in this field.

Explain your answer. [2 marks]

4 The diagram below shows the female reproductive system.

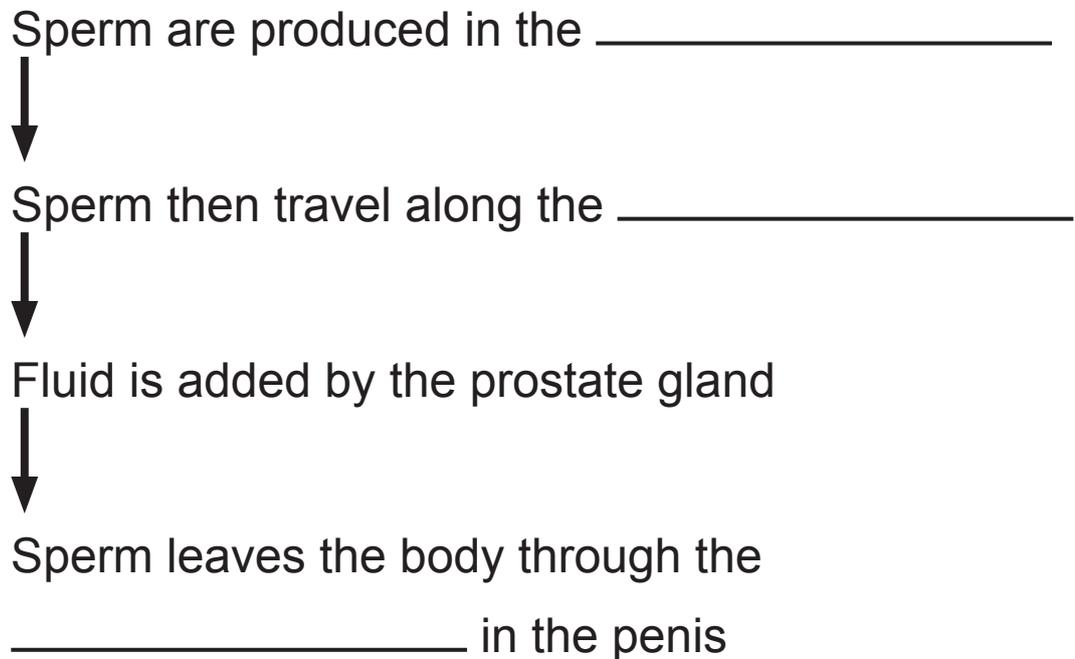


(a) Complete the table below using letters (A, B, C or D) to identify the parts whose function is described.
[2 marks]

Function	Part
fertilisation takes place here	
produces eggs	

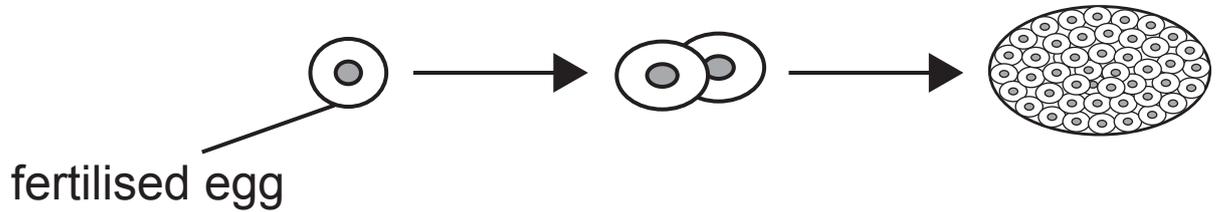
(b) A sperm is the male sex cell.

- (i)** Complete the flow chart below to name the parts of the male reproductive system that the sperm passes through. [3 marks]



- (ii)** State the function of the fluid added by the prostate gland. [1 mark]
- _____

(c) Fertilisation takes place when the sperm meets the egg. Some of the stages that a fertilised egg goes through as it travels to the uterus are shown below.



(i) What name is given to the fertilised egg? [1 mark]

Circle your answer.

zygote

embryo

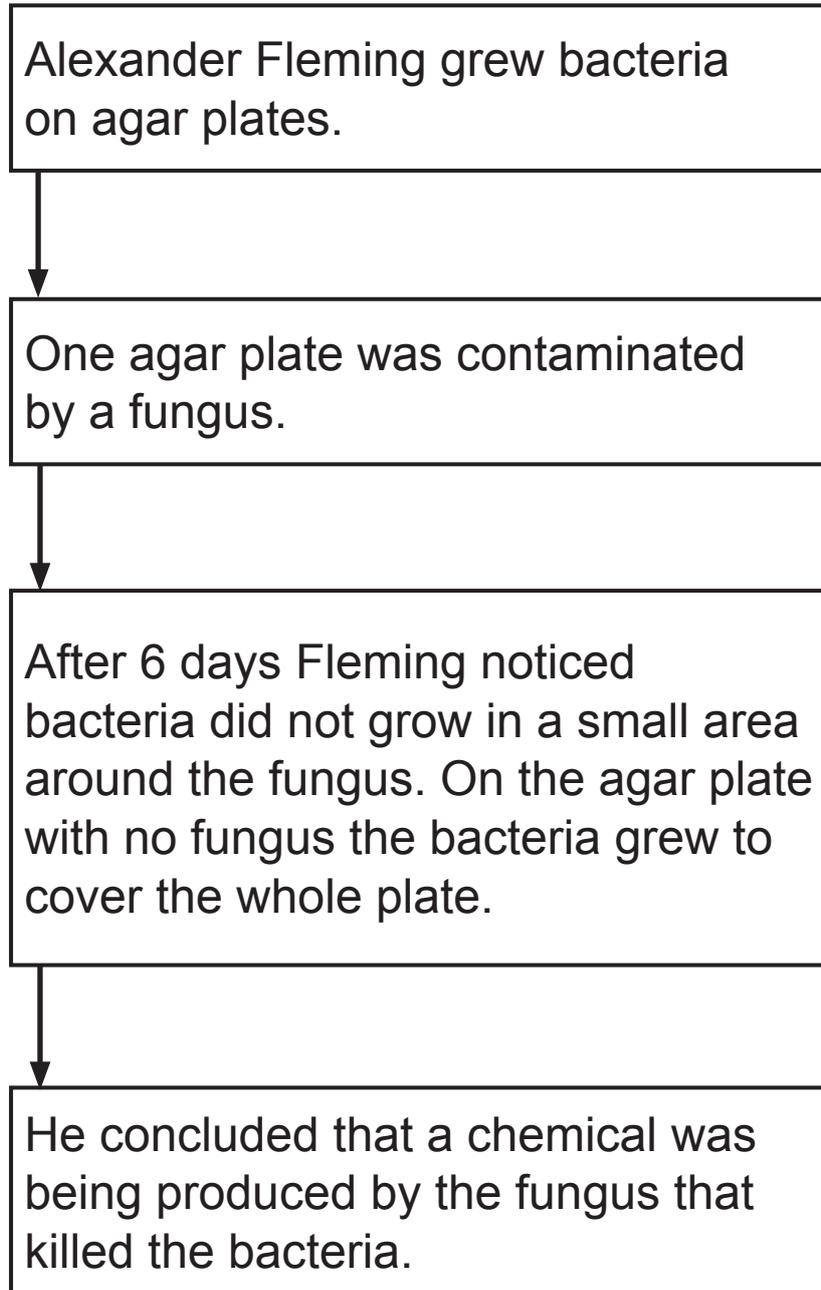
foetus

(ii) Describe what happens to the fertilised egg as it travels to the uterus. [1 mark]

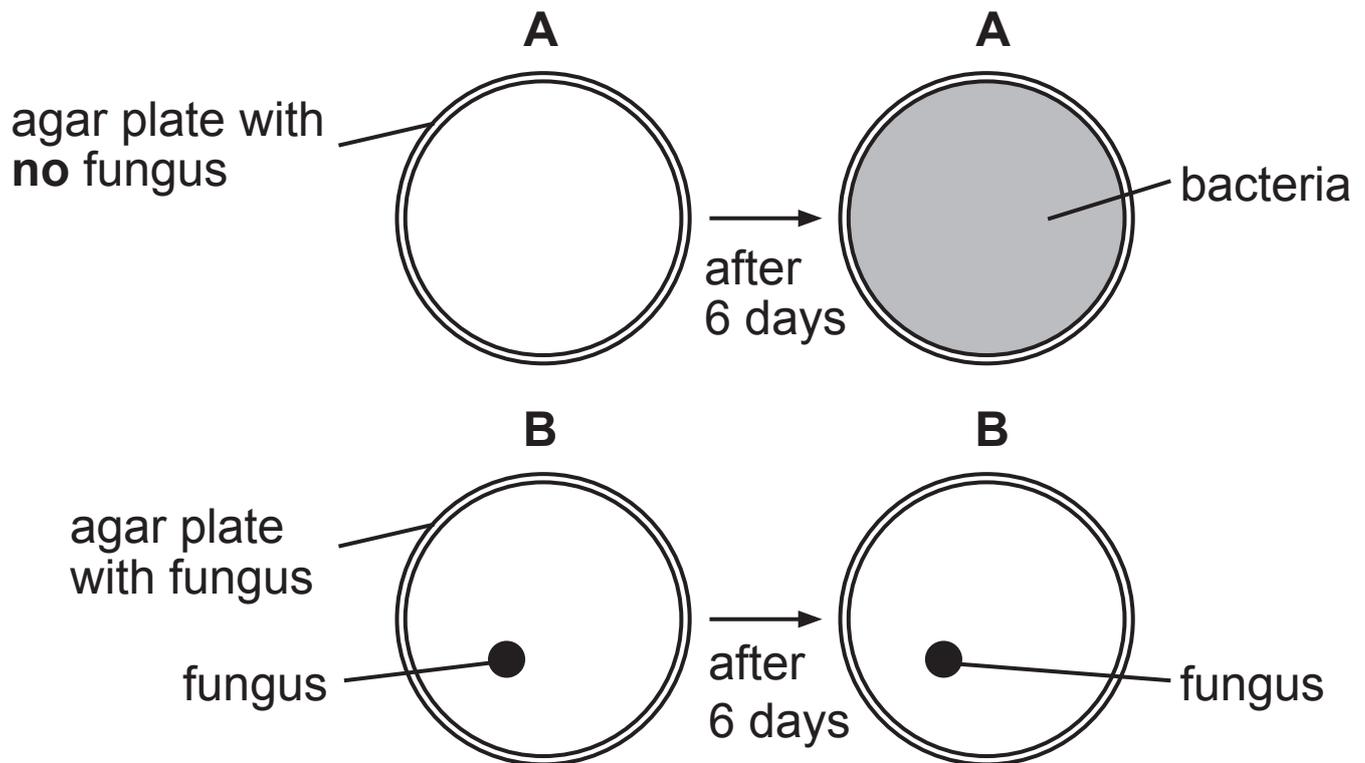
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(Questions continue overleaf)

- 5 The flow chart below gives some of the steps in the discovery of penicillin.



(a) Using information given in the flow chart **complete** the diagram below for plate **B** to show the appearance of the agar plate with fungus **after 6 days**. [2 marks]



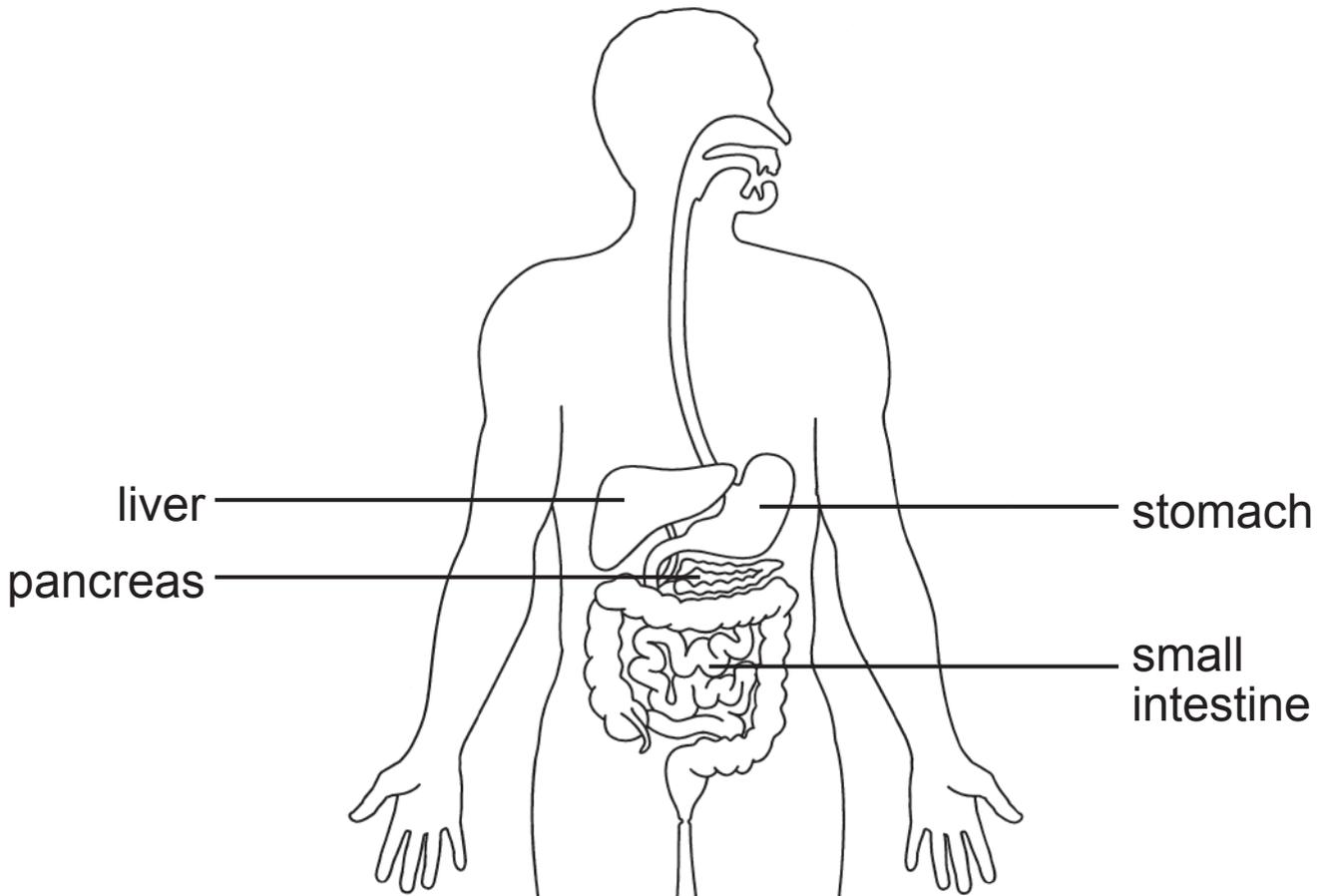
(b) Apart from Alexander Fleming name **one** other scientist who was responsible for the further development of penicillin. [1 mark]

(c) Explain fully why penicillin can be described as an antibiotic. [2 marks]

Chlamydia is a disease caused by a bacterium.

(d) How is chlamydia spread between humans? [1 mark]

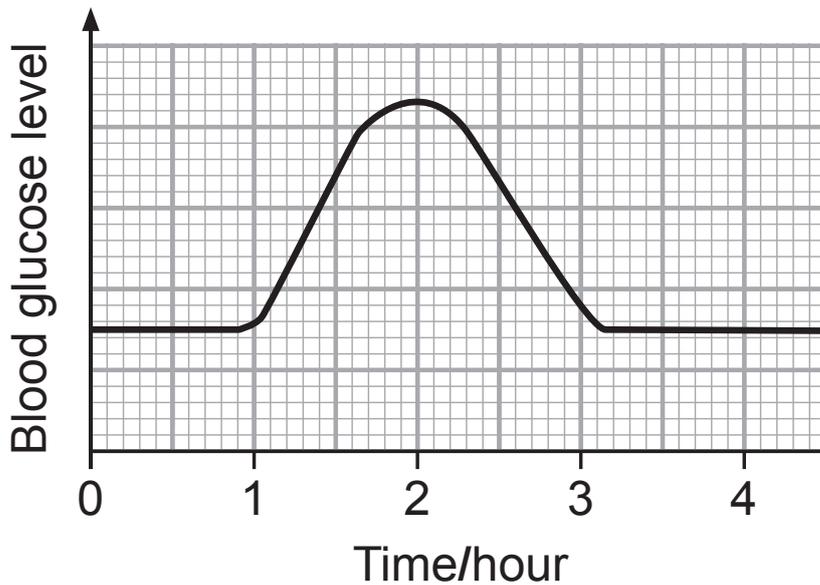
- 6 (a) The diagram below shows some organs in the human body.



- (i) Name the organ, shown in the diagram, that produces the hormone insulin. [1 mark]

- (ii) On the diagram place an **X** to show the target organ where insulin acts. [1 mark]

(b) The graph below shows how a person's blood glucose level can change over a period of time.

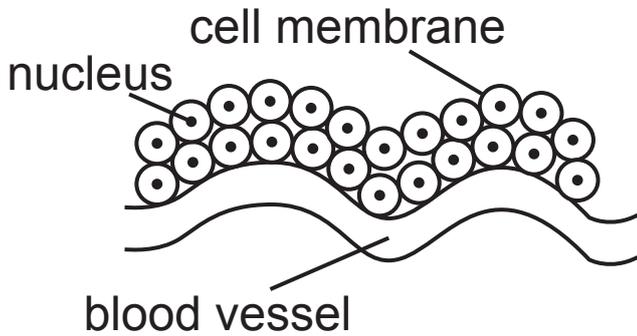


(i) Suggest what could have caused the blood glucose level to rise after one hour. [1 mark]

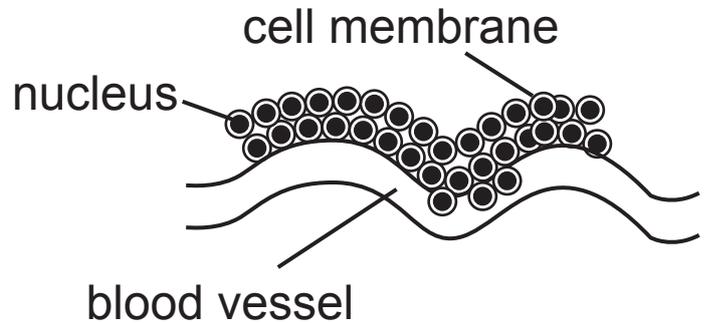
(ii) Describe what would happen to the blood glucose level if this person's body did not produce insulin. Explain why this happens. [2 marks]

7 (a) The diagram below shows normal cells and cancer cells.

Normal



Cancer



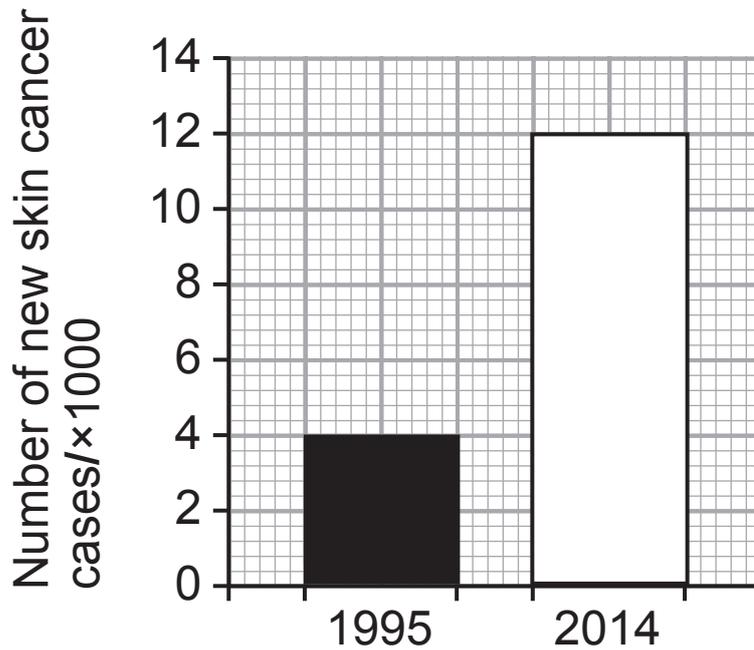
Use the diagram to answer the questions below.

(i) Describe **two** differences between normal cells and cancer cells. [2 marks]

1. _____
2. _____

(ii) Suggest how some cancer cells could be spread to other parts of the body. [1 mark]

- (b) The graph below shows the number of new cases of skin cancer in 1995 and 2014.



- (i) Name the environmental factor that causes skin cancer. [1 mark]

- (ii) Calculate the percentage increase in new cases between the two years. [2 marks]
(Show your working out.)

_____ %

- (iii) Suggest **one** reason why the number of skin cancer cases is increasing. [1 mark]

- 8 Oxford Island is a nature reserve located on the shores of Lough Neagh. There are many different habitats including woodland, scrub, meadow, wetlands and a wildlife garden.

Each type of habitat supports a wide variety of flowering plants, animals and other living things such as fungi and lichen.

The wildlife garden has a species-rich hedgerow of native trees and a wildlife pond surrounded by willow and insect friendly bushes which provide food and shelter for invertebrates.

(a) Using the information above answer the following questions.

- (i) Explain fully why this nature reserve has a high biodiversity. [2 marks]

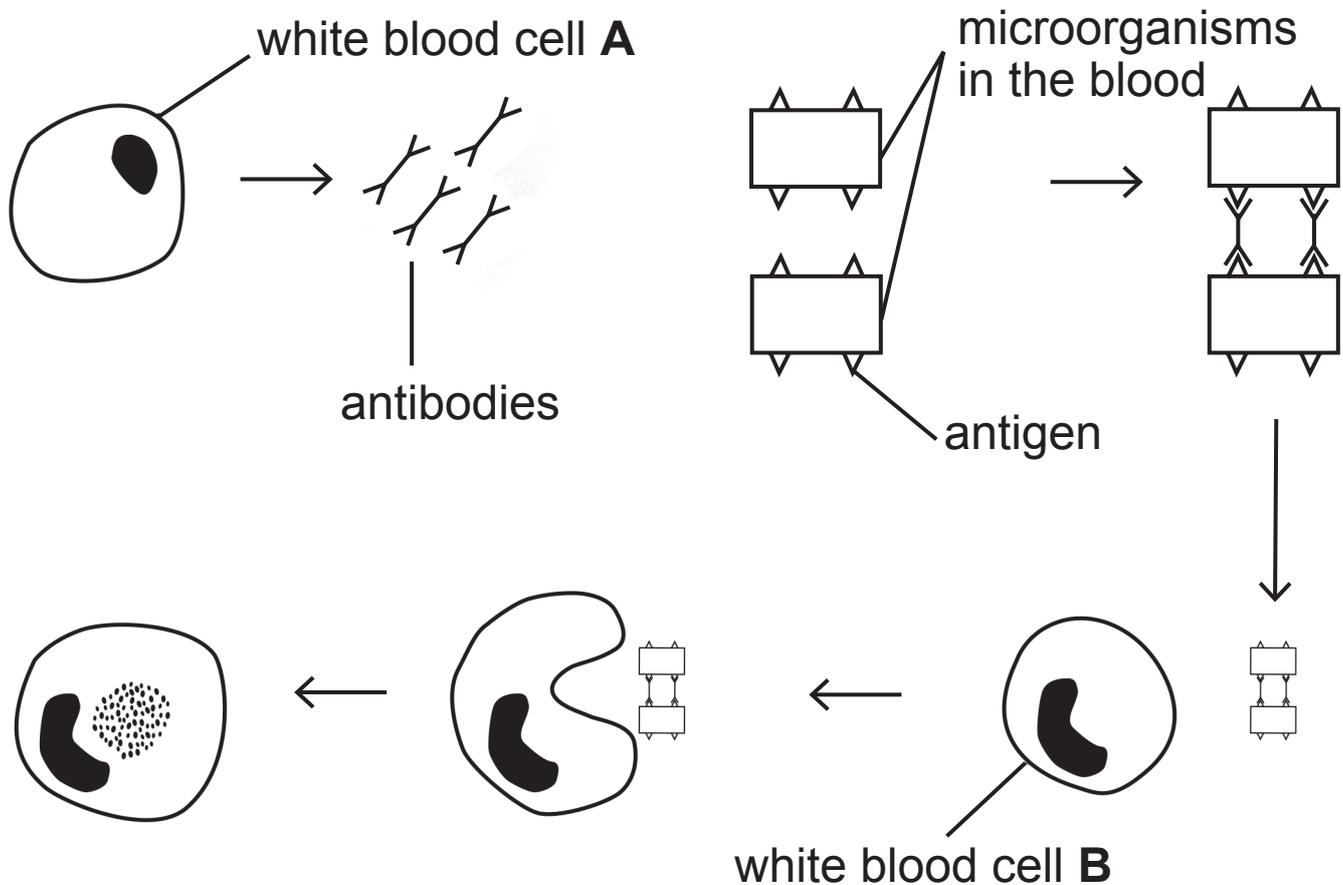
- (ii) Why are lichen described as a **biotic** factor? [1 mark]

- (iii) Suggest how the number of lichen in Oxford Island would compare to the number of lichen in a city centre. Explain your answer. [2 marks]

(b) One way biodiversity has been increased in Lough Neagh is through the protection of fish stocks. Apart from setting quotas suggest two other ways in which fish stocks could be protected in Lough Neagh.
[2 marks]

1. _____
2. _____

9 The diagram below shows how white blood cells within the body respond to infection.



Using the diagram and your knowledge describe and explain how the two types of white blood cell respond to a microorganism. [6 marks]

Your answer should include:

- the names of the two types of white blood cell, **A** and **B**;
- how each type of white blood cell responds to the microorganism.

SOURCES:

- Q1(a)Source: Principal Examiner
- Q1(c).....Source: Principal Examiner
- Q3(d)Source: Principal Examiner
- Q4.....Source: Principal Examiner
- Q4(c).....Source: Principal Examiner
- Q6(a)Source: Principal Examiner
- Q7(a)Source: Principal Examiner
- Q9.....Source: Principal Examiner

For Examiner's use only	
Question Number	Marks
1	
2	
3	
4	
5	
6	
7	
8	
9	

Total Marks	
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Examiner Number

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