Rewarding Learning

Centre Number

Candidate Number

General Certificate of Secondary Education
2024–2025

Single Award Science: Biology

Unit 1

Foundation Tier

[GSA11]

GSA11

MONDAY 11 NOVEMBER 2024, 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)**.

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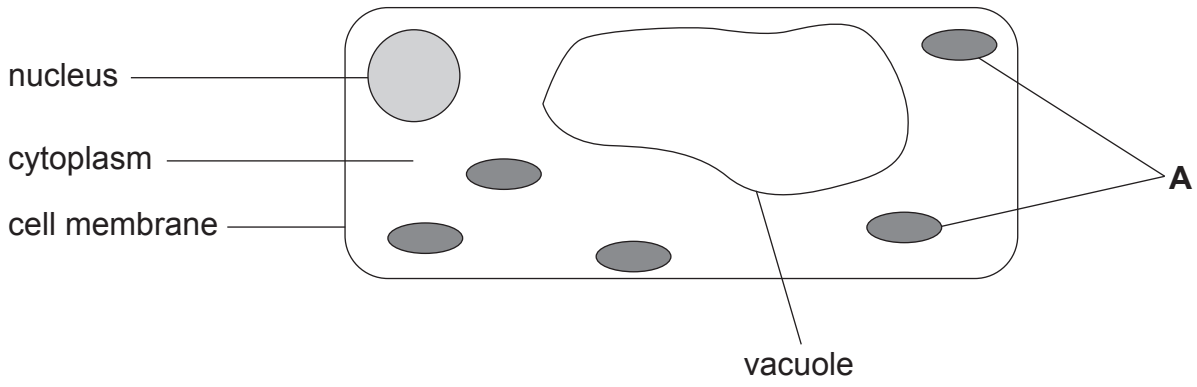
20GSA1101

1 The diagram below shows some parts of a plant cell.
The cell wall is missing from the diagram.



(a) **Draw the cell wall** on the diagram above. [1]

The structures labelled **A** in the diagram contain chlorophyll.

(b) Name the structures labelled **A**.

_____ [1]

The cell wall and the structures labelled **A** are only found in plant cells.

(c) Name the other structure, shown in the diagram, that is **only** found in plant cells.

_____ [1]

(d) What is the function of the cell membrane?

Circle your answer.

control centre of the cell

controls what substances enter and leave the cell

chemical reactions take place here

[1]

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2 Cigarette (tobacco) smoke contains harmful substances.

(a) Name the harmful substance in cigarette (tobacco) smoke that causes

lung cancer. _____

less oxygen to be carried in the blood. _____

[2]

(b) A harmful substance in cigarette (tobacco) smoke makes it difficult to give up smoking.

(i) Name this substance.

_____ [1]

(ii) Explain why this substance makes it difficult to give up smoking.

_____ [1]

[Turn over

3 The photograph below shows fields with hedgerows around them.

Complete the sentences below about hedgerows.

Choose from:

biodiversity **shelter**

competition **food** **sun**

Hedgerows increase the _____ of an area by increasing the number of different types of plants and animals.

Animals can use the hedgerows to find _____ and _____. [3]

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(Questions continue overleaf)

4 Food is a source of energy in humans.

(a) What **type** of energy does food provide?

Circle your answer.

light **electrical** **chemical**

[1]

(b) The table below describes the steps in an investigation to find the energy content of 1 g of food.

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

Letter	Step
A	measure the temperature of the water at the start
B	weigh out 1 g of food
C	measure 20 cm^3 of water and place it in a boiling tube
D	light the food and hold it under the boiling tube
E	measure the temperature of the water when the food stops burning

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

The first step has been done for you.

B → _____ → _____ → _____ → _____ [2]

(ii) Name the apparatus that you would use to measure the temperature of the water.

_____ [1]

The investigation was repeated using a food that contained **more energy.**

(iii) What effect, if any, would this have on the temperature **rise** of the water?

_____ [1]

Food is made up of biological molecules.

(c) Name the **two** biological molecules that provide the body with the most energy.

1. _____

2. _____ [2]

Eating a balanced diet may help prevent health conditions such as heart disease.

(d) Name **one** other health condition that may be prevented by eating a balanced diet.

_____ [1]

Lifestyle choices may also help prevent health conditions such as heart disease.

(e) Give **two** lifestyle choices that may help prevent health conditions such as heart disease.

1. _____

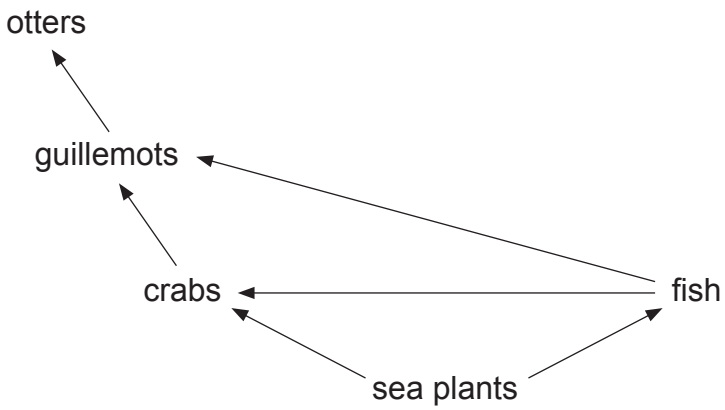
_____

2. _____

_____ [2]

5 The photograph shows a guillemot.

The diagram below shows part of a food web.



(a) What is the original source of energy for this food web?

_____ [1]

(b) Name **one** producer and **one** primary consumer in this food web.

Producer _____

Primary consumer _____ [2]

(c) Use the food web to complete the food chain below. The first and last organisms have been filled in for you.

sea plants → [ ] → [ ] → [ ] → otters

[2]

Foxes feed on guillemots.

(d) **Add an arrow and a label** for foxes to the food web opposite to show that they feed on guillemots. [2]

(e) If a disease killed a large number of fish, what effect, if any, would this have on the number of guillemots? Give a reason for your answer.

Effect _____

Reason _____

_____ [2]

6 Photosynthesis is a process that happens in the leaves of green plants.

(a) Complete the word equation below for photosynthesis.

carbon dioxide + [ ] → glucose + [ ]

[2]

An investigation was carried out on photosynthesis in a plant.
The plant was destarched at the start of the investigation.

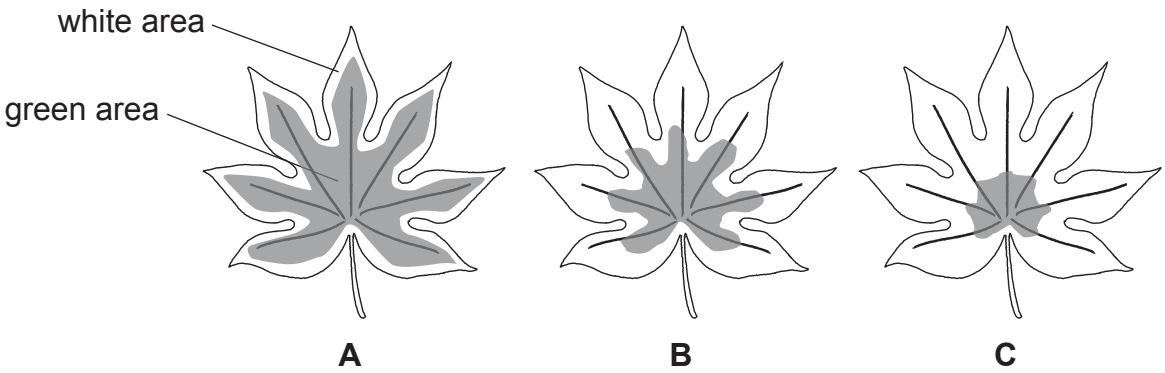
(b) Suggest how the plant could have been destarched.

_____

_____

_____ [2]

Leaves contain chlorophyll which is needed for photosynthesis.
Chlorophyll is green.
The leaves of this plant have white areas and green areas.
The diagram shows the white areas and green areas on three leaves, **A**, **B** and **C**.



The plant was left in bright light after it had been destarched.

(c) Which of the leaves, **A**, **B** or **C**, carried out the **least** photosynthesis?
Explain your answer.

Leaf _____

Explanation _____

_____ [2]

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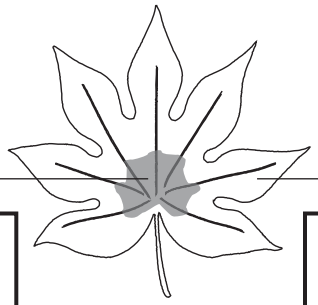
(d) Each leaf was tested for starch after it had been left in bright light.

(i) Name the chemical used to test a leaf for starch.

_____ [1]

(ii) In the boxes on the diagram below, write the colour of the chemical in the green area and the white area, after one of the leaves was tested for starch.



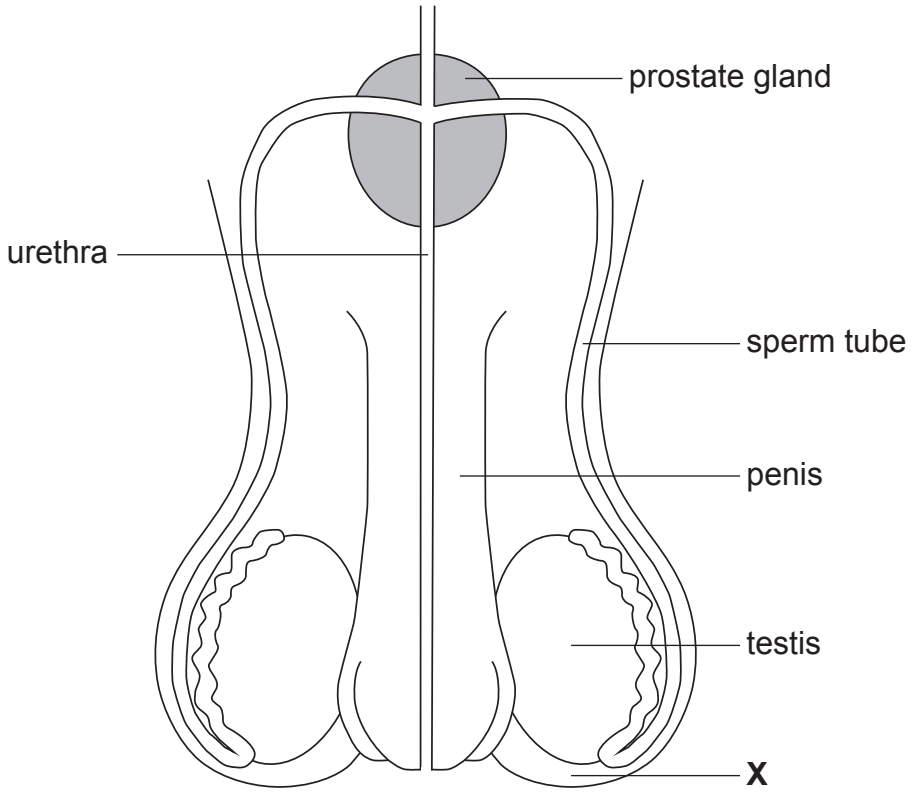
green area _____ white area

colour of chemical after testing for starch	colour of chemical after testing for starch
_____	_____

[2]

[Turn over

7 **(a)** The diagram below shows the male reproductive system.



(i) Name the part labelled **X**.

_____ [1]

(ii) Give the function of the

sperm tube. _____

_____

prostate gland. _____

_____ [2]

(iii) Name the part of the male reproductive system that places sperm into the vagina of a female.

_____ [1]

(b) The nucleus of a sperm cell contains genetic structures.

(i) Name these genetic structures.

_____ [1]

These genetic structures are made of a chemical with a double helix shape.

(ii) Name this chemical.

_____ [1]

(c) When a sperm cell reaches an egg cell, their nuclei may fuse.

(i) What term is used to describe the process of the nuclei of a sperm cell and an egg cell fusing?

_____ [1]

(ii) Name the part of the female reproductive system where this process takes place.

_____ [1]

8 **(a)** **(i)** Explain how cancer cells are produced.

_____

_____ [1]

Skin cancer can be triggered by an environmental factor.

(ii) Name this environmental factor.

_____ [1]

(b) The table below gives some information about cancer cases in Northern Ireland from 2016 to 2020.

Average number of cancer cases per year	13 684
Average number of deaths from cancer per year	
Average number of survivors of cancer per year	9183

(i) Use information from the table above to calculate the average number of deaths from cancer per year, from 2016 to 2020.
Write your answer in the empty box in the table above. [1]

The equation below shows how to calculate the average **percentage of survivors** of cancer per year.

$$\text{average percentage of survivors} = \frac{\text{average number of survivors}}{\text{average number of cancer cases}} \times 100$$

(ii) Use information from the table and the equation above to calculate the average percentage of survivors per year.

Give your answer to **one decimal place**.

Show your working out.

_____ % [3]

[Turn over

9 Using contraception helps to prevent pregnancy by stopping sperm from reaching an egg.

(a) Suggest why some people are against the use of contraception.

_____

_____ [1]

(b) Explain how the condom, the contraceptive pill and male sterilisation each prevent the sperm from reaching an egg.

Which of these methods of contraception helps to prevent the spread of sexually transmitted infections (STIs)?

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

Condom

_____

_____

_____

_____

_____

Contraceptive pill

_____

_____

_____

_____

_____

Male sterilisation

Method that helps prevent the spread of STIs

[6]

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Question 6(c) . . . . Principal Examiner
Question 6(d)(ii) . . Principal Examiner
Question 7(a) . . . . Principal Examiner
Question 8(b) . . . . Source: Adapted from Northern Ireland Cancer Registry | N. Ireland Cancer Registry

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Question Number	Marks
1	
2	
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Examiner Number

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