



General Certificate of Secondary Education
2023

Centre Number

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Candidate Number

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Biology

Unit 1

Foundation Tier



[GBL11]

GBL11

TUESDAY 16 MAY, MORNING

TIME

1 hour 15 minutes.

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 in black ink only. **Do not write with a gel pen.**

Answer **all ten** questions.

INFORMATION FOR CANDIDATES

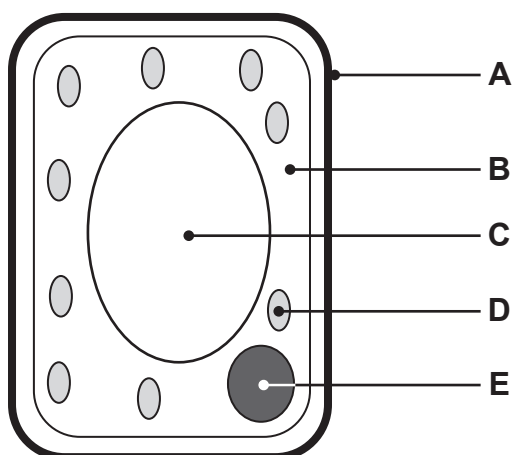
The total mark for this paper is **75**.

Figures in brackets printed down the right-hand side of pages indicate the marks awarded to each question or part question.

Quality of written communication will be assessed in Question **7(b)**.



- 1 The diagram shows some structures found in a plant cell.



Source: Principal Examiner

Look at the diagram.

- (a) Complete the table to give the name or function of the structures labelled A to E.

Structure	Name	Function
A		provides support
B	cytoplasm	
C		contains cell sap
D	chloroplast	
E	nucleus	

[5]

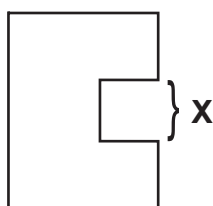
- (b) Give the letters of **two** structures in the diagram which are also found in animal cells.

_____ and _____

[1]



2 (a) The diagram shows an enzyme.



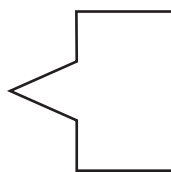
Source: Principal Examiner

Look at the diagram.

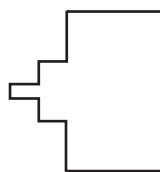
(i) Name the part of the enzyme labelled **X**.

[1]

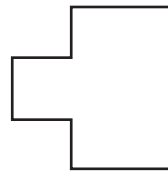
(ii) Which of the following substrates, **A**, **B** or **C**, would this enzyme break down?



A



B



C

Source: Principal Examiner

Substrate _____

[1]

(iii) Name this model of enzyme action.

[1]

(b) Name the type of enzyme which breaks down

protein. _____

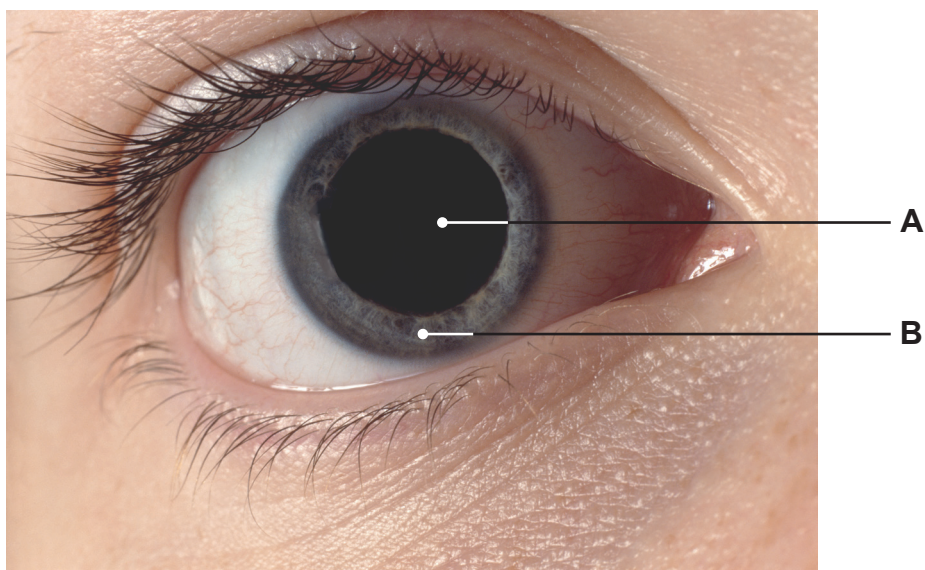
fat. _____

[2]

[Turn over]



- 3 The photograph shows the front of a human eye in dim light.



Source: © Adam Hart-Davis / Science Photo Library

Look at the photograph.

- (a) Name parts **A** and **B**.

A _____

B _____

[2]

- (b) (i) Describe the change to part **A** when a bright light is switched on.

[1]



(ii) Suggest why this change is necessary to protect the eye.

[2]

Light entering the eye is refracted (bent) on to the retina.

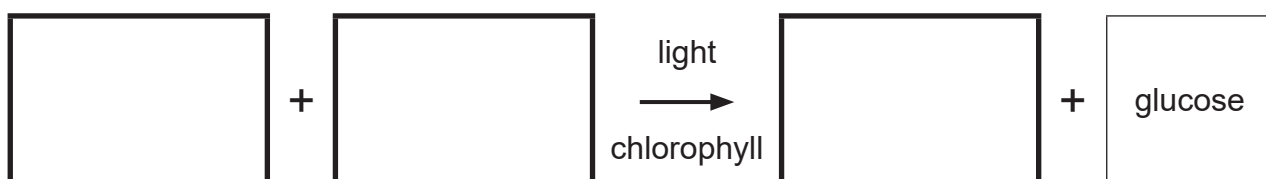
(c) Name **two** parts of the eye which refract (bend) light.

1. _____
2. _____

[2]



4 (a) Complete the word equation for photosynthesis.



[3]

(b) (i) Name the **complex carbohydrate** used by plants to store glucose.

[1]

(ii) Suggest **one other** way a plant uses the glucose produced during photosynthesis.

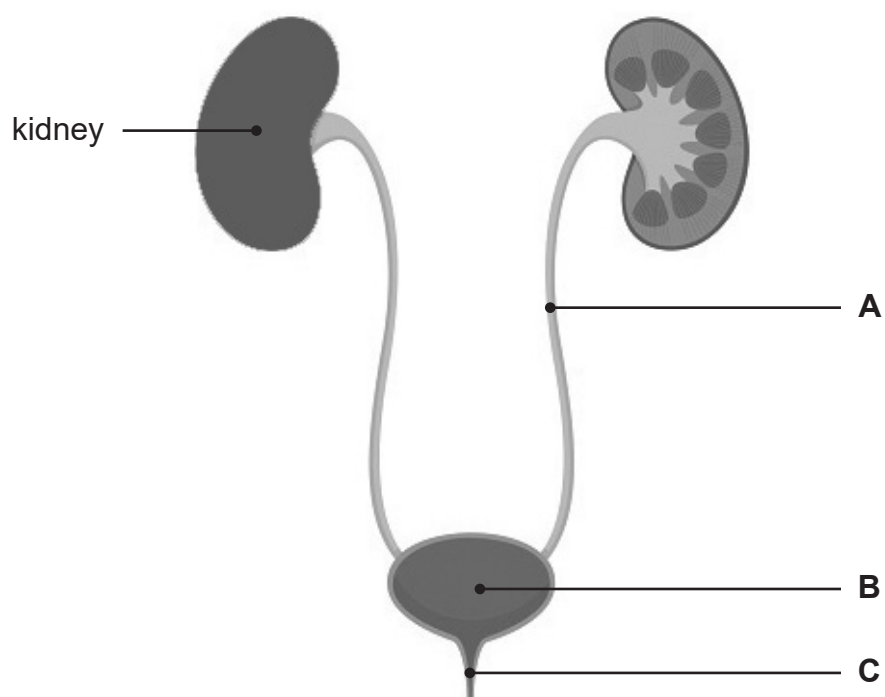
[1]

(c) Use the word equation to help you explain why photosynthesis is an **endothermic** process.

[1]



5 The diagram shows part of the excretory system.



Source: © Getty Images

Look at the diagram.

(a) Name parts **A**, **B** and **C**.

A _____

B _____

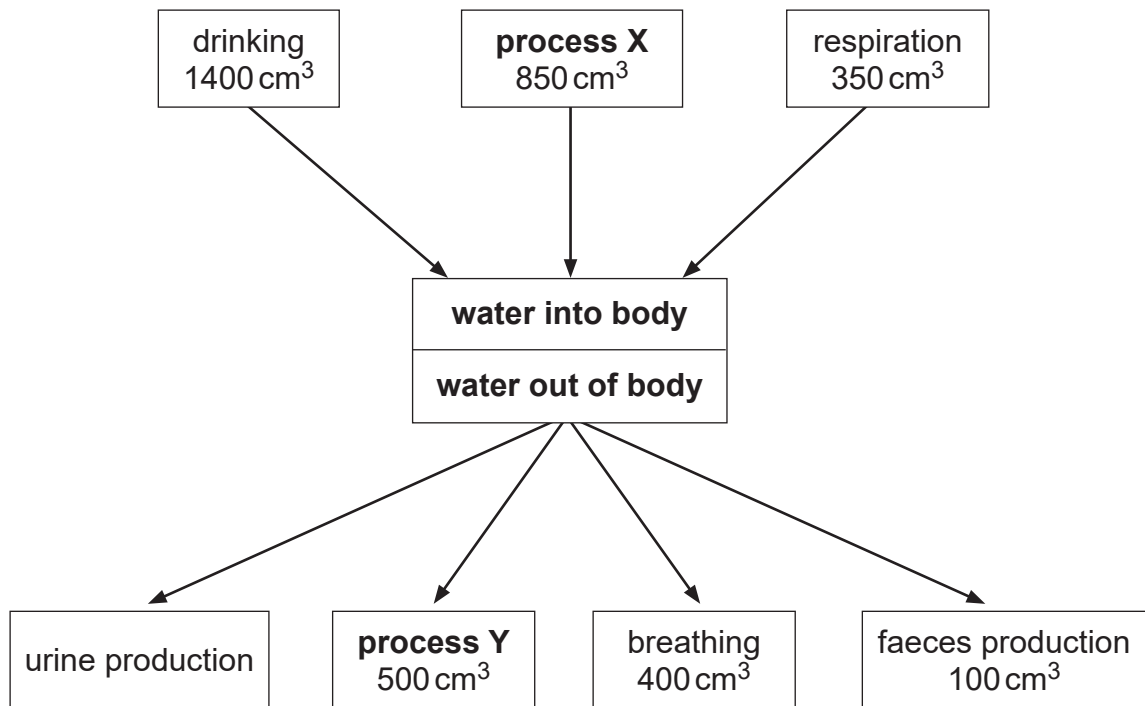
C _____

[3]



- (b) The body has to balance the volume of water it takes in with the volume of water it loses.

The diagram shows the volume of water taken in and lost by different processes over 24 hours.



Look at the diagram.

- (i) Name processes **X** and **Y**.

X _____

Y _____

[2]



(ii) Calculate the volume of water lost in urine.

Show your working.

Volume of urine _____ cm^3 [3]

(iii) Suggest why the volume of water lost by process Y is lower in winter.

_____ [1]



- 6 The photographs show three stages in the life cycle of a sustainable forest.

Stage A



Stage B



Stage C



Source: Principal Examiner



Look at the photographs.

Stage C shows recently planted trees.

(a) Name the process of planting new trees.

_____ [1]

(b) Suggest how spreading out the trees when planting helps them grow better.

_____ [2]

(c) Describe how planting more sustainable forests affects the level of oxygen and carbon dioxide in the atmosphere.

oxygen _____

carbon dioxide _____ [2]

Many forests have a variety of species of trees planted.

(d) Suggest **two** ways this increases biodiversity.

1. _____

2. _____

_____ [2]

[Turn over



7 (a) A hormone is a chemical messenger which is released by a gland and transported to a target organ.

(i) Name the hormone which controls blood glucose concentration.

[1]

(ii) Name the gland which produces this hormone.

[1]

(iii) Name the target organ for this hormone.

[1]





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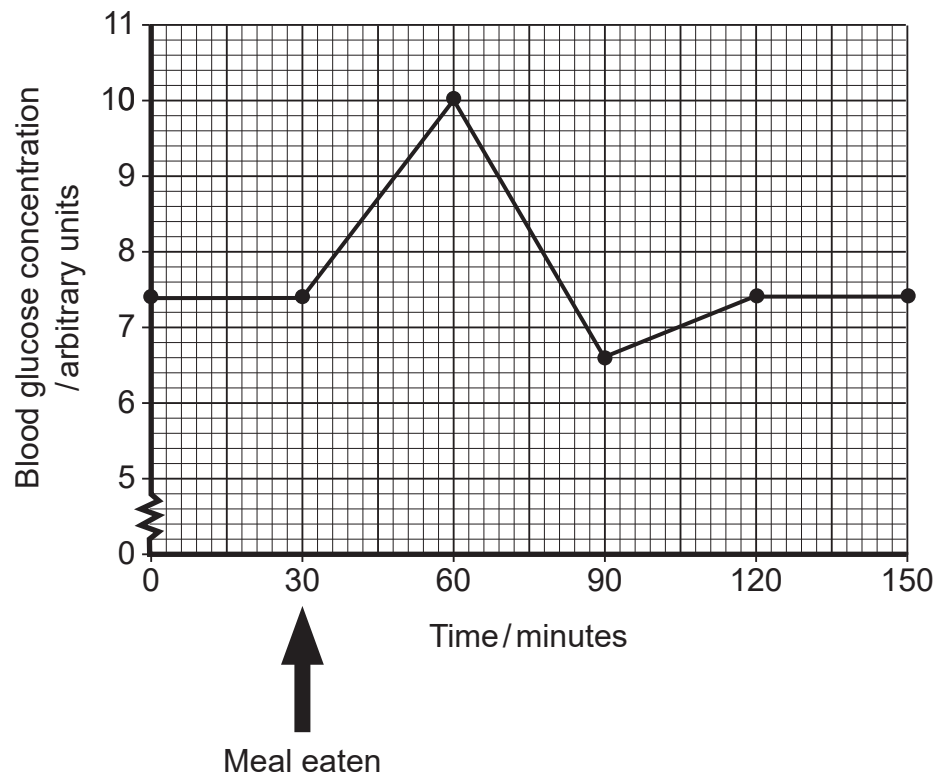
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[Turn over



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The graph shows the effect of eating a meal on the blood glucose concentration of a healthy student.



Look at the graph.

- (b) • Describe how blood glucose concentration changes during the first 60 minutes **after** eating a meal.

Use **data** from the graph to support your answer.

- Give the time taken for blood glucose concentration to return to normal **after** eating a meal.
- Explain how the hormone returns blood glucose concentration to normal.



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

Description _____

Time _____

Explanation _____

[6]

[Turn over



- 8 (a) The diagram shows a food chain from a vegetable garden.

lettuce → snail → thrush (bird)

Look at the diagram.

- (i) Describe the role of the lettuce in this food chain.

[2]

- (ii) Name the secondary consumer in this food chain.

[1]

- (iii) What do the arrows represent in a food chain?

[1]





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(b) A group of students investigated this food chain by:

- estimating the population size of each organism.
- calculating the mean biomass of each organism.
- calculating the biomass of the population of each organism.

The table shows their results.

Organism	Population size	Mean biomass of each organism / g	Biomass of population / g
Lettuce	40		6000
Snail	100	16	1600
Thrush	1	100	100

Look at the table.

(i) Complete the table by calculating the mean biomass of **one** lettuce.

Show your working.

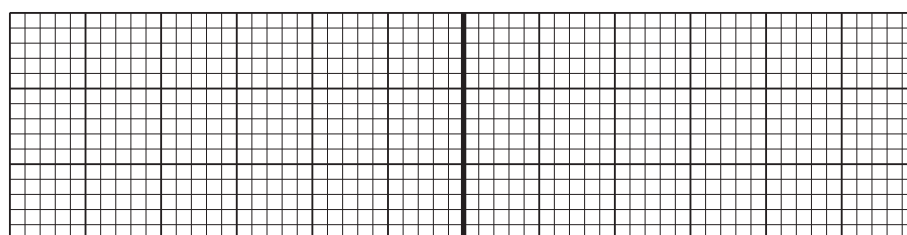
_____ g [2]



(ii) Use the information in the table to draw a pyramid of biomass for this food chain.

Use the scale of 1 small square to represent 100 g.

Use the key shown.



[3]

The students concluded the biomass decreased at each trophic level in the food chain because there was a decrease in energy available.

(c) Give **two** reasons why the energy available decreases at each trophic level in **this** food chain.

1. _____

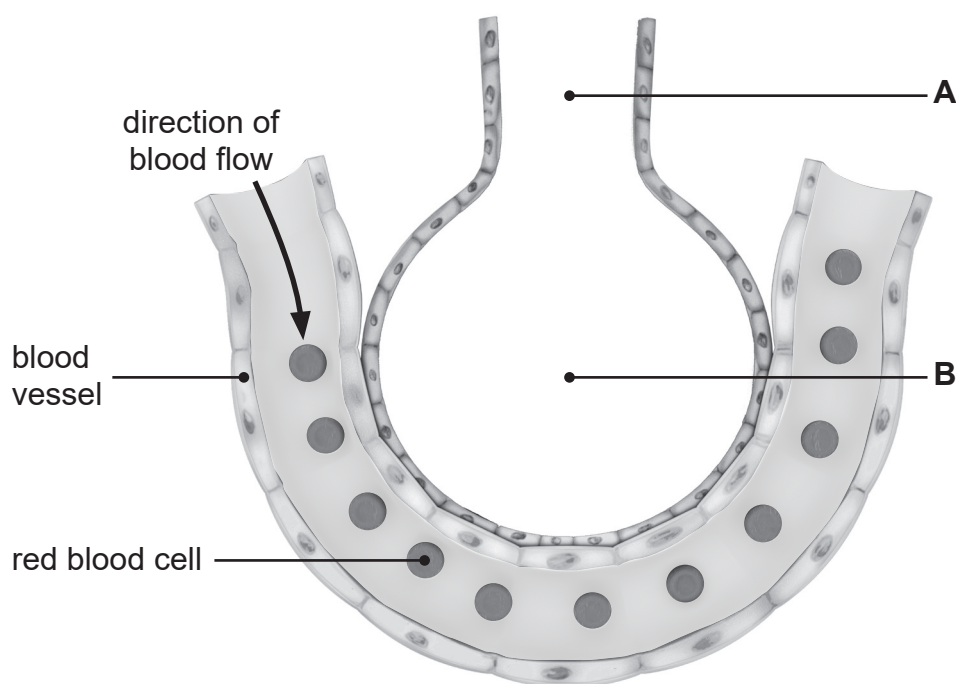
2. _____

[2]

[Turn over]



9 The diagram shows part of the respiratory system.



Source: © Getty Images

(a) Name parts **A** and **B**.

A _____

B _____

[2]

(b) On the diagram, draw an arrow to show the movement of oxygen when gas exchange occurs during **breathing in**.

[1]



(c) Use the diagram to help describe and explain **two** ways the respiratory system is adapted for gas exchange.

1. Description _____

Explanation _____

2. Description _____

Explanation _____

_____ [4]



- 10 (a) The photograph shows a Sumatran tiger. It lives in forests on the island of Sumatra in Indonesia.



Source: © Getty Images

Table 1 shows the change in the population of Sumatran tigers on the island over a period of 40 years.

Table 1

Year	Number of Sumatran tigers
1980	1000
1990	850
2000	750
2010	625
2020	495

Source: Adapted from © Project Ark Foundation



(i) What is meant by the term 'population'?

[1]

Look at **Table 1**.

(ii) Calculate the percentage decrease in the number of Sumatran tigers from **1990** to **2010**.

Show your working.

_____ % [3]



- (b) **Table 2** shows the area of forest on the island of Sumatra between 1990 and 2010.

Table 2

Year	Area of forest/million hectares
1990	21
2000	16
2010	13

Source: Adapted from www.news.mongabay.com/2012/08/

- (i) Use evidence from **Table 1** and **Table 2** to suggest and explain what may have caused the change in the population of Sumatran tigers.

[2]

- (ii) Suggest **one other** cause of this change in the population of Sumatran tigers.

[1]

- (iii) Suggest **one** government initiative which could be introduced to protect the population of Sumatran tigers.

[1]

Source for Table 2: "Mapping and monitoring deforestation and forest degradation in Sumatra (Indonesia) using Landsat time series data sets from 1990 to 2010" © Belinda Arunarwati Margono et al 2012. *Environ. Res. Lett.* 7 034010DOI 10.1088/1748-9326/7/3/034010 Published 19 July 2012





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Question Number	Marks
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Examiner Number

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