

Surname _____

Other Names _____

Centre Number _____

For Examiner's Use

Candidate Number _____

Candidate Signature _____

ASSESSMENT AND QUALIFICATIONS ALLIANCE

General Certificate of Secondary Education

Foundation Tier

June 2010

Additional Science

Unit Biology B2

Biology

Unit Biology B2

Written Paper

BLY2F

Friday 21 May 2010 9.00 am

**You will need no other materials.
You may use a calculator.**

TIME ALLOWED

- **45 minutes plus your additional time allowance.**

At the top of the page, write your surname and other names, your centre number, your candidate number and add your signature.

[Turn over]

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INSTRUCTIONS

- **Use black ink or black ball-point pen.**
- **Answer ALL questions.**
- **You must answer the questions in the spaces provided. Do not write outside the box around each page or on blank pages.**
- **Do all rough work in this book. Cross through any work you do not want to be marked.**

INFORMATION

- **The marks for questions are shown in brackets.**
- **The maximum mark for this paper is 45.**
- **You are expected to use a calculator where appropriate.**
- **You are reminded of the need for good English and clear presentation in your answers.**

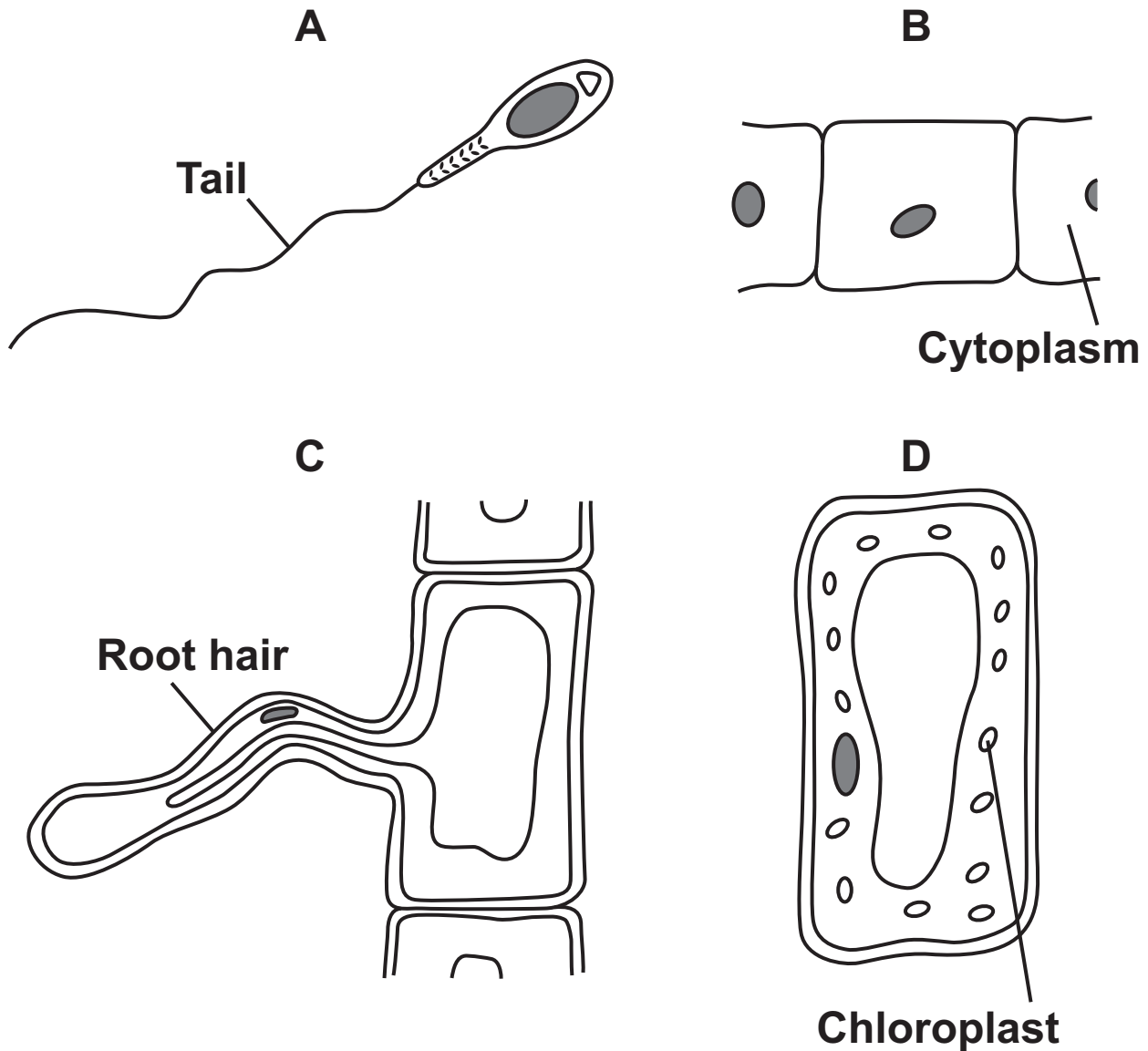
ADVICE

- **In all calculations, show clearly how you work out your answer.**

DO NOT TURN OVER UNTIL TOLD TO DO SO

Answer ALL questions in the spaces provided.

- 1 The diagrams show four types of cell, A, B, C and D.
Two of the cells are plant cells and two are animal cells.



1 (a) (i) Which TWO of the cells are plant cells? [1 mark]

Tick (✓) ONE box.

A and B

A and D

C and D

1 (a) (ii) Which part is found ONLY in plant cells?
[1 mark]

Draw a ring around ONE answer.

cell membrane

cell wall

nucleus

[Question 1 continues on the next page]

1 (b) (i) Which cell, A, B, C or D, is adapted for swimming? [1 mark]

1 (b) (ii) Which cell, A, B, C or D, can produce glucose by photosynthesis? [1 mark]

1 (c) Cells A, B, C and D all use oxygen.

For what process do cells use oxygen?
[1 mark]

Draw a ring around ONE answer.

osmosis

photosynthesis

respiration

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TURN OVER FOR THE NEXT QUESTION

2 This question is about what happens during decay.

Draw a ring around the correct word to complete each sentence.

[1 mark + 1 mark + 1 mark + 1 mark]

2 (a) After living things die, they are decayed by

**animals.
microorganisms.
plants.**

2 (b) Decay happens faster when there is plenty of

oxygen and conditions are

**cold.
dry.
moist.**

2 (c) During decay carbon dioxide is produced by

**osmosis.
respiration.
photosynthesis.**

2 (d) Decay releases mineral salts into the soil.

These mineral salts are absorbed by plant

leaves.

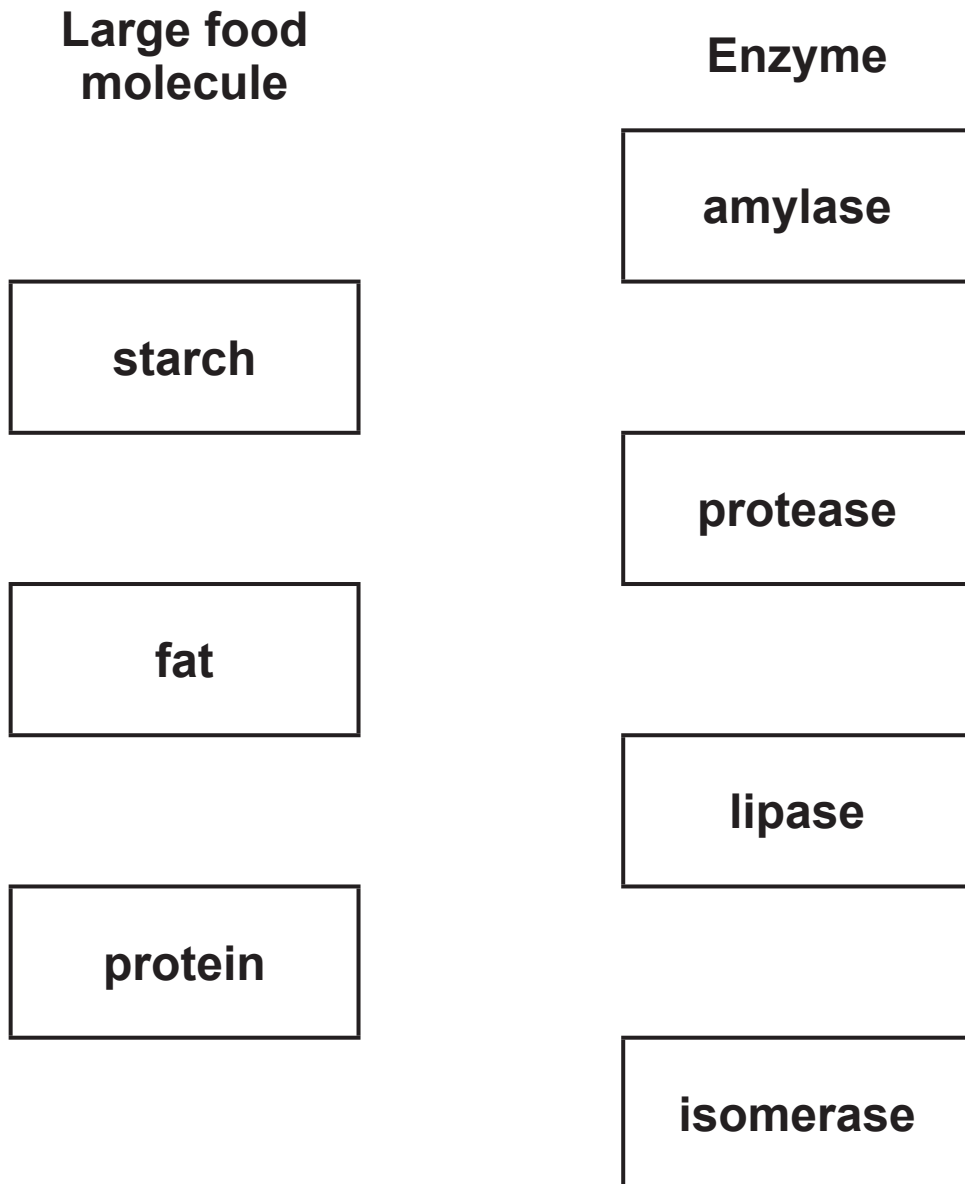
roots.

stems.

[Turn over for the next question]

3 The body uses enzymes to digest (break down) large food molecules into smaller molecules.

3 (a) (i) Draw **ONE** line from **EACH** large food molecule to the enzyme that acts on it. [3 marks]



3 (a) (ii) Draw a ring around the correct answer to complete each sentence. [3 marks]

Starch is broken down into

amino acids.
fatty acids and glycerol.
sugars.

Fat is broken down into

amino acids.
fatty acids and glycerol.
fructose.

Protein is broken down into

amino acids.
fructose.
sugars.

3 (b) Bile helps digestion.

Where is bile produced? [1 mark]

Draw a ring around ONE answer.

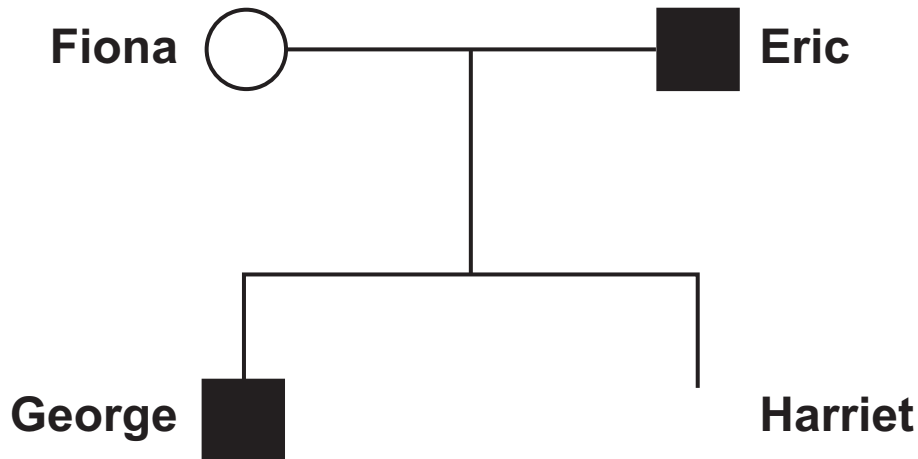
liver

mouth

stomach

- 4 The family tree shows the inheritance of a disorder caused by a dominant allele.

Fiona and Eric have two children George and Harriet.



KEY

■ Male with disorder

● Female with disorder

□ Male without disorder

○ Female without disorder

- 4 (a) The son, George, has the disorder.

The daughter, Harriet, does NOT have the disorder.

- 4 (a) (i) Use the key to draw the symbol for Harriet next to her name ON THE FAMILY TREE.
[2 marks]

- 4 (a) (ii) The symbol D represents the dominant allele for the disorder.
The symbol d represents the recessive allele.

Fiona has the pair of alleles dd.

Write the correct pairs of alleles in the boxes.
[3 marks]

Harriet has the pair of alleles .

A person with the disorder could have the pair of alleles or the pair of alleles .

[Question 4 continues on the next page]

4 (b) Before Harriet was born, a doctor suggested that Fiona should have the embryo 'screened'.

4 (b) (i) Give ONE reason why the doctor suggested screening. [1 mark]

Tick (✓) ONE box.

To check for the D allele

To check the sex of the embryo

To cure the disorder

4 (b) (ii) Why do some people believe that embryos should NOT be screened? [1 mark]

5 **Diabetes is a disease in which the concentration of glucose in a person's blood may rise to fatally high levels. Insulin controls the concentration of glucose in the blood.**

5 (a) **Where is insulin produced? [1 mark]**

Draw a ring around ONE answer.

gall bladder

liver

pancreas

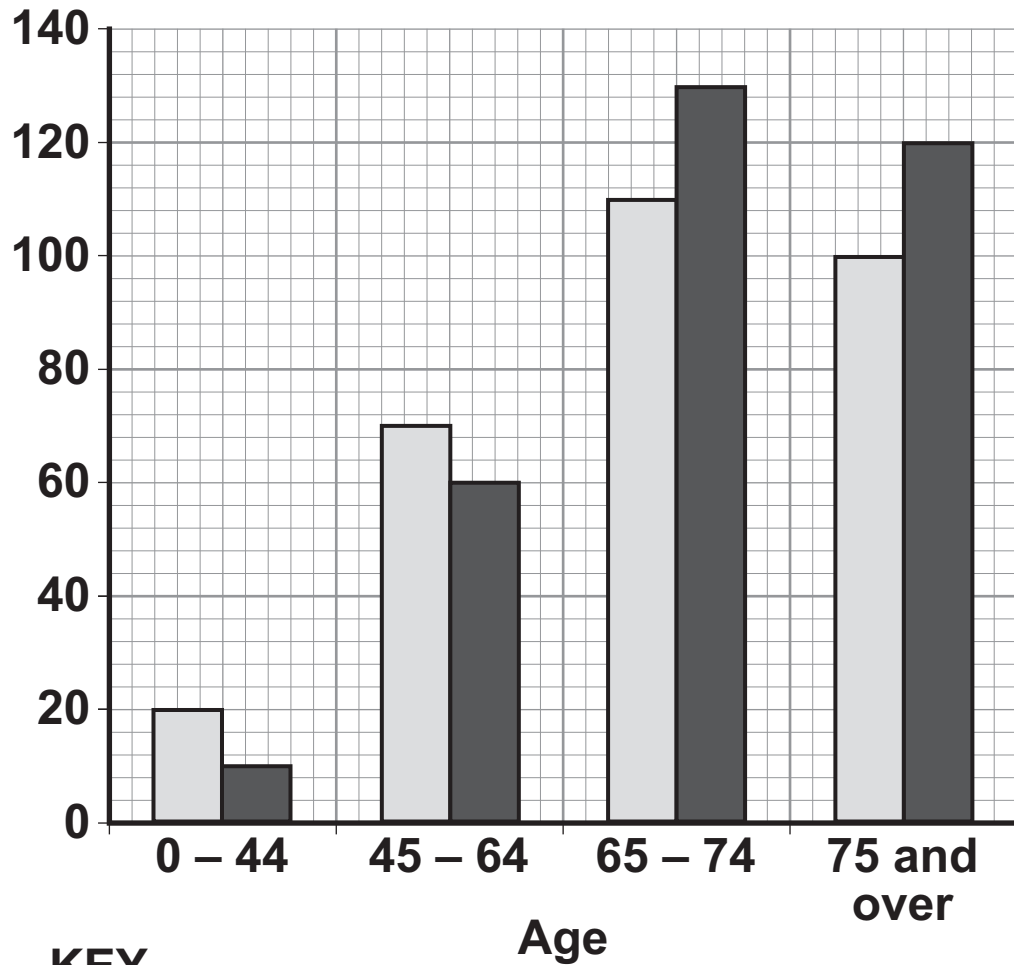
5 (b) **Diabetics may control their blood glucose by injecting insulin.**

Apart from using insulin, give ONE other way diabetics may reduce their blood glucose. [1 mark]

[Question 5 continues on the next page]

- 5(c) The bar chart shows the number of people with diabetes in different age groups in the UK.

Number of
people with
diabetes
per 1000



KEY

Female

Male

5(c) (i) Describe how the number of males with diabetes changes between the ages of 0–44 and 75 and over. [3 marks]

5(c) (ii) Compare the number of males and females with diabetes: [2 marks]

between the ages of 0 and 64 years

over the age of 65.

6 This question is about photosynthesis.

6 (a) Plants make glucose during photosynthesis. Some of the glucose is changed into insoluble starch.

What happens to this starch? [1 mark]

Tick (✓) ONE box.

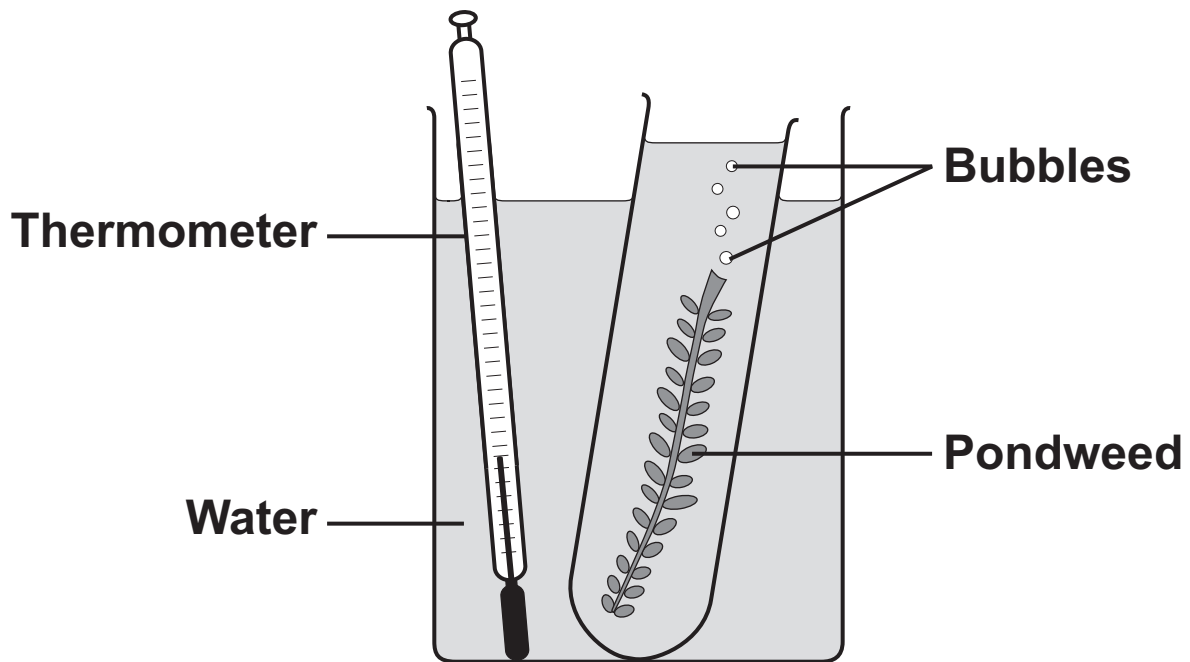
The starch is converted into oxygen.

The starch is stored for later use.

The starch is used to make the leaf green.

- 6 (b) A student investigated the effect of temperature on the rate of photosynthesis in pondweed.

The diagram shows the way the experiment was set up.



- 6 (b) (i) The student needed to control some variables to make the investigation fair.

State TWO of these variables. [2 marks]

- 1 _____
- 2 _____

[Question 6 continues on the next page]

6 (b) (ii) The bubbles of gas are produced only while photosynthesis is taking place.

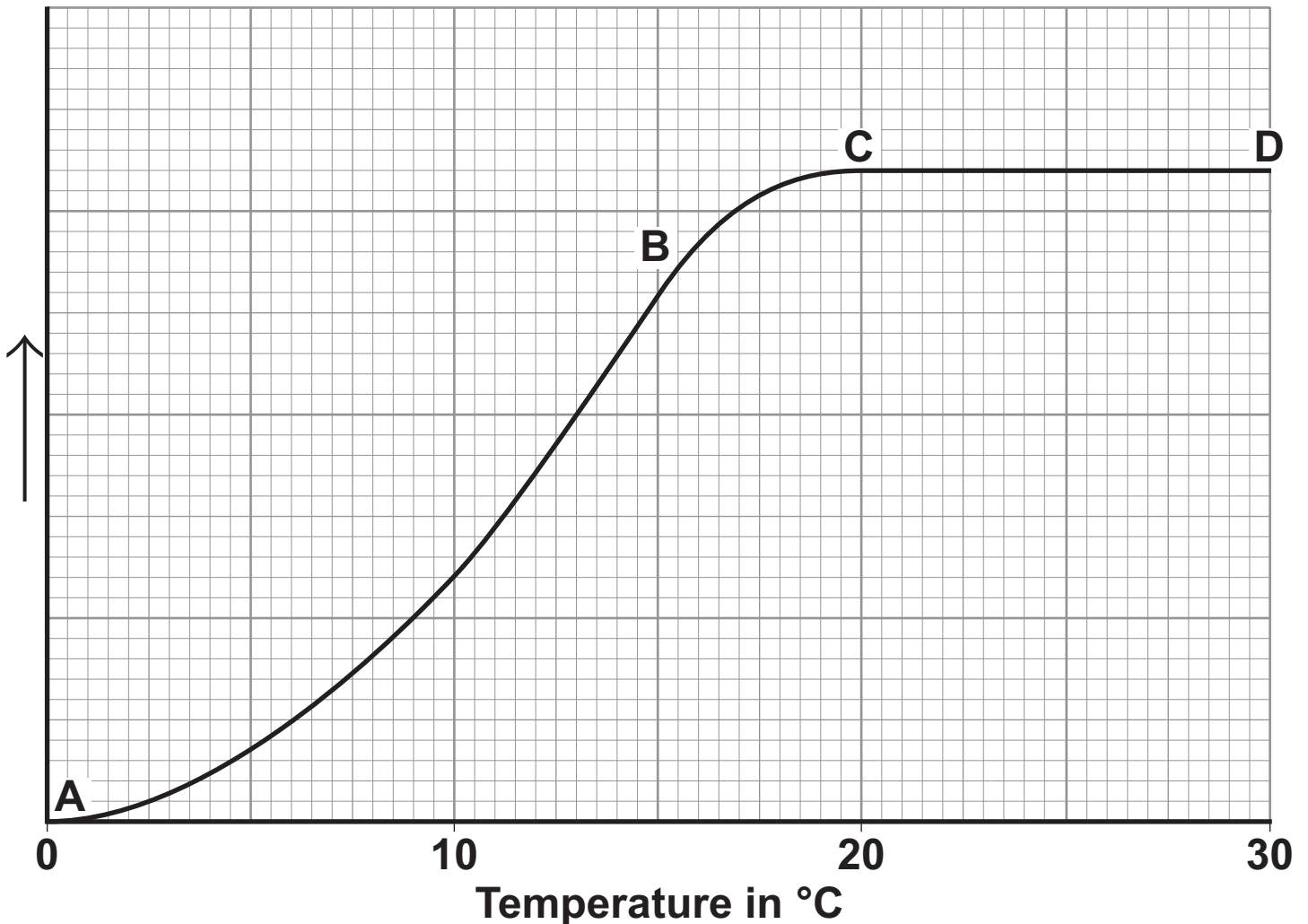
What TWO measurements would the student make to calculate the rate of photosynthesis?
[2 marks]

1 _____

2 _____

6 (c) The graph shows the effect of temperature on the rate of photosynthesis.

Rate of photosynthesis



6 (c) (i) Name the factor that limits the rate of photosynthesis between the points labelled A and B on the graph. [1 mark]

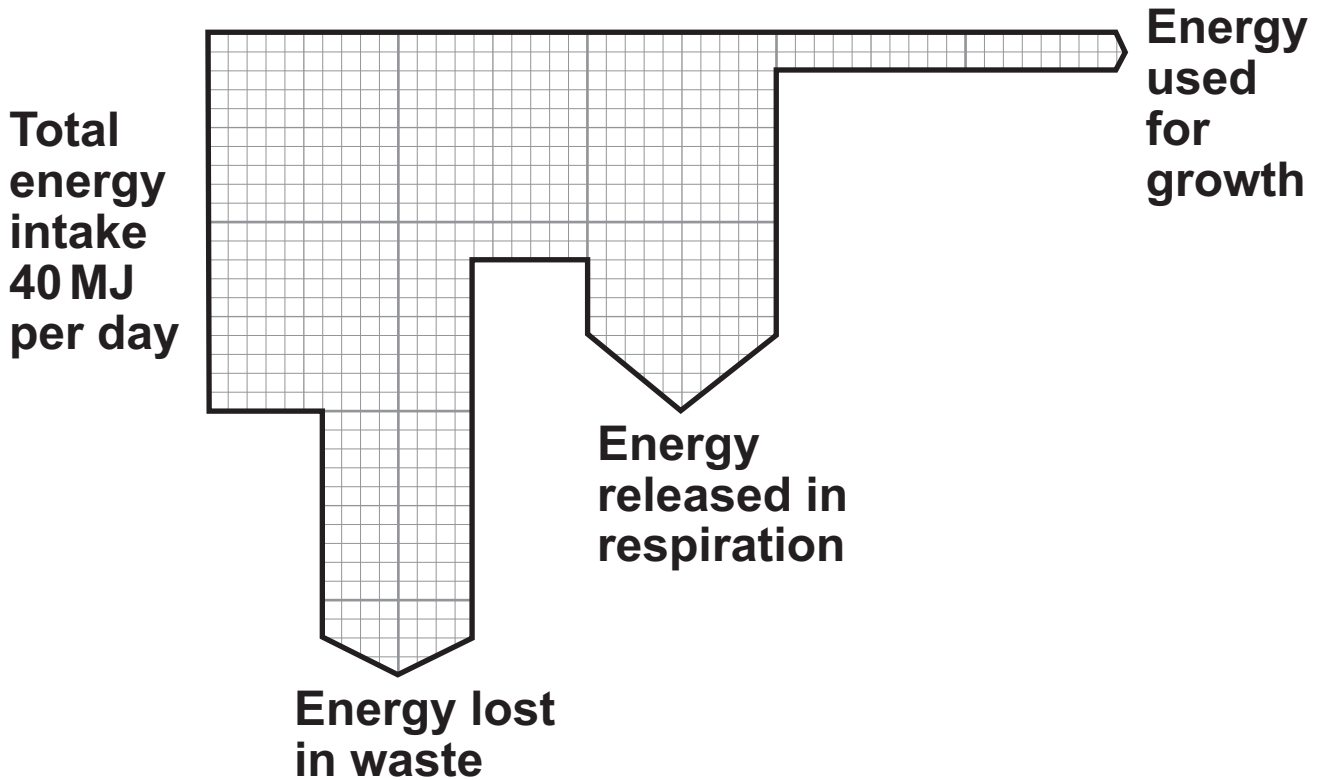
6 (c) (ii) Suggest which factor, carbon dioxide, oxygen or water, might limit the rate of photosynthesis between the points labelled C and D on the graph. [1 mark]

7

[Turn over for the next question]

- 7 (a) **DIAGRAM 1** represents what happens to the energy in the food eaten by a herbivore (an animal that eats plants).

DIAGRAM 1



- 7 (a) (i) How much energy is released in respiration by the herbivore? [1 mark]

Answer _____ MJ per day

7 (a) (ii) What proportion of the total energy intake of the herbivore is used for growth? [2 marks]

Show clearly how you work out your answer.

Proportion _____

7 (b) Give TWO ways in which the energy, released in respiration, is used by a herbivore. [2 marks]

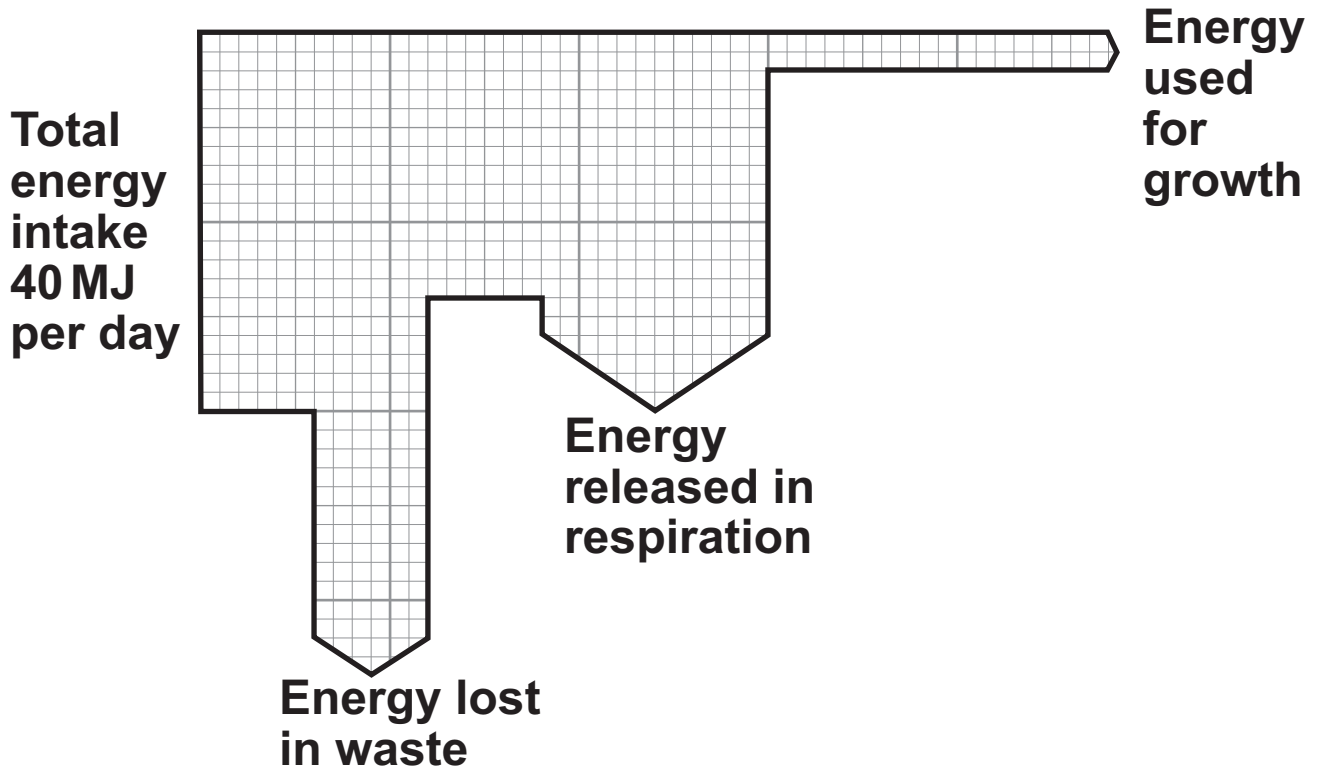
1 _____

2 _____

[Question 7 continues on the next page]

- 7 (c) **DIAGRAM 2** represents what happens to the energy in the food eaten by a carnivore (an animal that eats other animals).

DIAGRAM 2



The carnivore releases a greater proportion of energy in respiration than the herbivore.

Suggest ONE reason for this. [1 mark]

7 (d) Some farmers keep their animals outdoors.
Other farmers keep their animals indoors.

Keeping farm animals indoors increases
the proportion of energy in their food that is
converted into growth.

Give TWO reasons why. [2 marks]

1 _____

2 _____

8

END OF QUESTIONS

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For Examiner's Use	
Examiner's Initials	
Question	Mark
1	
2	
3	
4	
5	
6	
7	
TOTAL	

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