Practice Question Set For GCSE
Subject : Biology
Paper-1 Topic: B4 Bioenergetics

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Name of the Student:_____
Max. Marks : 26 Marks **Time : 26 Minutes**

Q1.

Anaerobic respiration in yeast is called fermentation.

The equation for fermentation is:

glucose → ethanol + carbon dioxide

(a) How does the equation show that fermentation is an **anaerobic** reaction?

_____

_____

(1)

Fermentation in yeast is used in the manufacture of beer, wine and bread.

(b) Why is fermentation used when making beer and wine?

_____

_____

(1)

(c) Explain why fermentation is used when making bread.

_____

_____

_____

_____

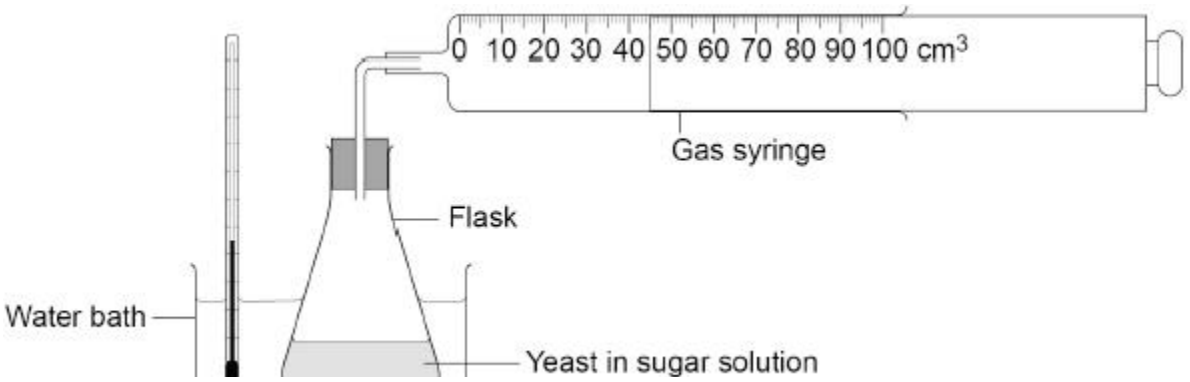
(2)

A student investigated fermentation in yeast.

Figure 1 shows the apparatus.

Figure 1

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This is the method used.

1. Mix yeast with sugar solution in a flask.
2. Put the flask in a water bath at 35 °C.
3. After 10 minutes attach a gas syringe to the flask.
4. Record the volume of carbon dioxide collected every 5 minutes for 1 hour.

(d) What volume of carbon dioxide has been collected in the gas syringe in the figure above?

Volume of carbon dioxide = _____ cm^3

(1)

(e) Why did the student wait 10 minutes before attaching the gas syringe?

Tick (✓) **one** box.

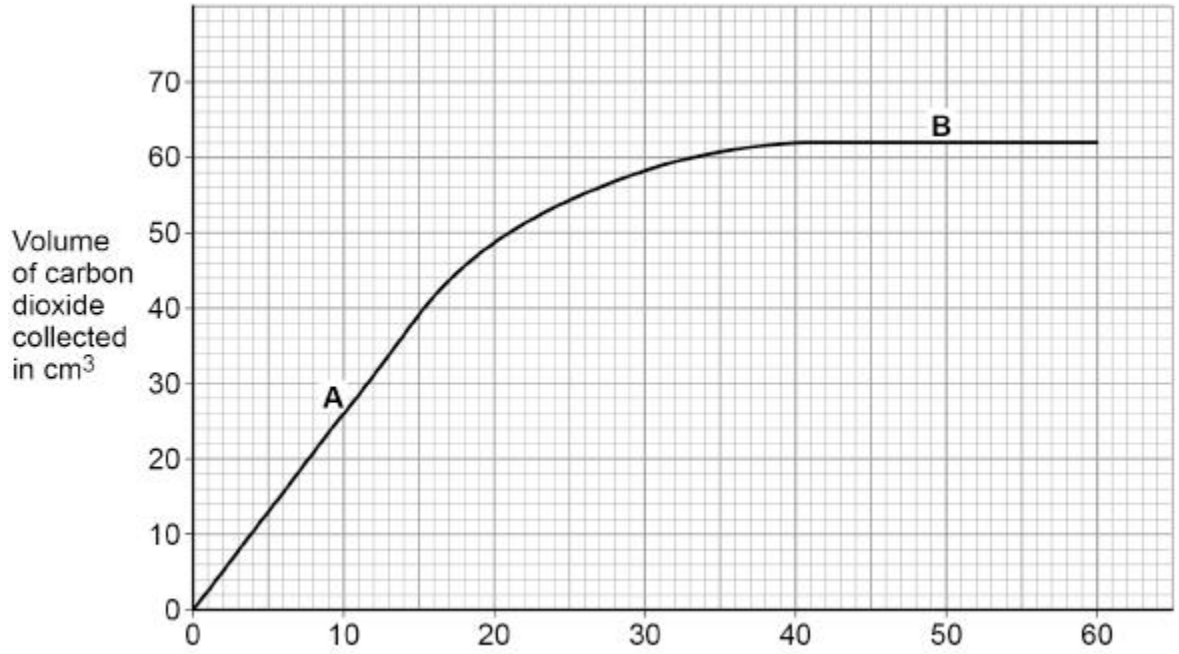
To allow time for the mixture to reach 35 °C	☐
To allow time for the sugar to dissolve	☐
To allow time to draw a results table	☐

(1)

Figure 2 shows the results.

Figure 2

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(f) **A** and **B** are different parts of the graph in **Figure 2**.

Draw **one** line from each part of the graph to the description of the reaction.

Part of the graph	Description of the reaction
	Carbon dioxide is **not** being produced
A	
	Carbon dioxide production is **fastest**
B	
	Carbon dioxide production is **slowing down**

(2)

The equation for fermentation is repeated here.

glucose → ethanol + carbon dioxide

(g) Suggest **one** reason why fermentation in the flask stopped.

_____

_____

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(1)

(h) Fermentation is controlled by enzymes.

The investigation was repeated at 2 °C and at 75 °C.

No carbon dioxide was produced at either of these temperatures.

Suggest why **no** carbon dioxide was produced at 2 °C or at 75 °C.

Reason at 2 °C _____

_____

Reason at 75 °C _____

_____

(2)

(i) Anaerobic respiration also happens in animal cells.

Complete the equation for anaerobic respiration in animal cells.

Choose answers from the box.

carbon dioxide	**ethanol**	**glucose**	**lactic acid**	**water**

_____ → _____

(2)

(Total 13 marks)

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Q2.

This question is about plant transport systems.

(a) Which **organ** in a plant absorbs water from the soil?

_____

(1)

(b) The concentration of nitrate ions in the soil is lower than the concentration of nitrate ions inside a plant.

How would the nitrate ions move from the soil into the cells of this plant?

Tick (✓) **one** box.

By active transport ☐

By diffusion ☐

By osmosis ☐

(1)

Dissolved sugars are transported in the phloem.

(c) What is the name of the process that moves dissolved sugars through the phloem?

Tick (✓) **one** box.

Evaporation ☐

Osmosis ☐

Translocation ☐

(1)

(d) Give **one** use of sugars in a plant.

_____

_____

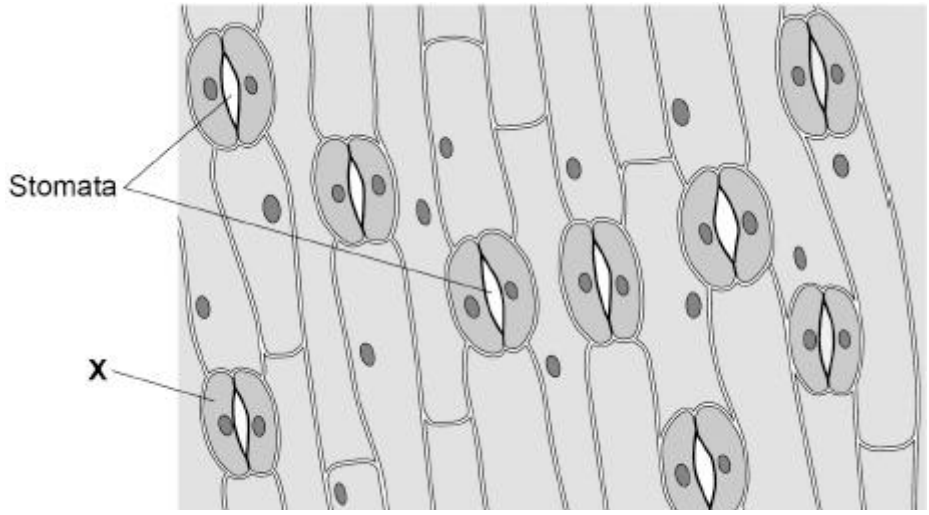
(1)

Stomata are openings on the surface of a leaf.

Stomata allow gases to move into and out of a leaf.

The figure below shows the surface of a leaf.

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(e) What is cell **X**?

Tick (✓) **one** box.

Guard cell ☐

Meristem cell ☐

Palisade cell ☐

(1)

(f) Why do the stomata open during the day?

Tick (✓) **one** box.

To allow carbon dioxide in ☐

To allow nitrogen in ☐

To allow oxygen in ☐

(1)

(g) The area of the leaf shown in the figure above is 0.25 mm^2.

Calculate the number of stomata per mm^2 for the leaf in the figure above.

Use the equation:

$$\text{number of stomata per mm}^2 = \frac{\text{number of stomata}}{\text{area in mm}^2}$$

_____

_____

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Number of stomata per mm^2 = _____

(2)

A student investigated the number of stomata per mm^2 on the upper and lower surfaces of leaves.

The leaves were taken from the same plant.

The table below shows the results.

Leaf	**Number of stomata per mm^2**	
	Upper surface	**Lower surface**
1	0	37
2	1	36
3	2	30
4	1	32
5	1	35
Mean	1	**X**

(h) Calculate mean value **X** in the table above.

_____

_____

_____

X = _____

(2)

(i) Water vapour is lost through stomata.

Explain the difference in the number of stomata on the upper and lower surfaces of the leaves.

Use the table above.

_____

_____

_____

_____

_____

_____

(3)

(Total 13 marks)

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