

Name of the Student: _____

Max. Marks : 22 Marks

Time : 22 Minutes

Q1.

Fermentation in yeast is used in the manufacture of bread and alcoholic drinks.

The equation for fermentation is:



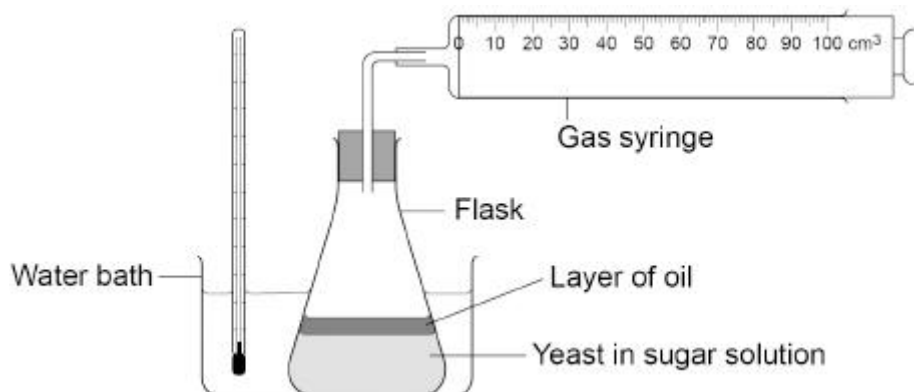
(a) Fermentation is an exothermic reaction.

What does exothermic mean?

(1)

A student investigated the effect of temperature on fermentation in yeast.

The figure below shows the apparatus.



This is the method used.

1. Mix yeast with sugar solution in a flask.
2. Pour a layer of oil over the surface of the mixture.
3. Put the flask in a water bath at 2 °C and leave for 20 minutes.
4. Attach a gas syringe.
5. Record the volume of gas collected every 5 minutes for 30 minutes.
6. After 30 minutes move the flask to a water bath at 35 °C.
7. Continue to record the volume of gas collected every 5 minutes.

(b) Suggest why a layer of oil was needed on the surface of the mixture.

(1)

(c) Suggest why the mixture was left for 20 minutes before the gas syringe was attached.

(1)

Steps 1 to 4 of the method were repeated at 35 °C.

The volume of gas collected was recorded every 5 minutes for 45 minutes.

Table 1 shows the results for both flasks for the first 30 minutes.

Table 2 shows the results for the last 15 minutes, when both flasks were at 35 °C.

Table 1

Time in minutes	Volume of gas collected in cm ³	
	Flask at 2 °C	Flask at 35 °C
0	0	0
5	0	26
10	0	52
15	0	78
20	0	98
25	0	108
30	0	115

Table 2

Time in minutes	Volume of gas collected in cm ³	
	Flask at 2 °C moved to 35 °C	Flask kept at 35 °C
35	2	120
40	7	123
45	22	124

(d) Explain the results from 0 minutes to 45 minutes for the flask that was at 2 °C and was then moved to 35 °C.

Use **Table 1** and **Table 2**.

(3)

(e) Explain the results from 0 minutes to 45 minutes for the flask kept at 35 °C.

Use **Table 1** and **Table 2**.

(4)

(Total 10 marks)

Q2.

This question is about plant transport systems.

- (a) Describe how water is transported from the soil to the atmosphere through a plant.

(4)

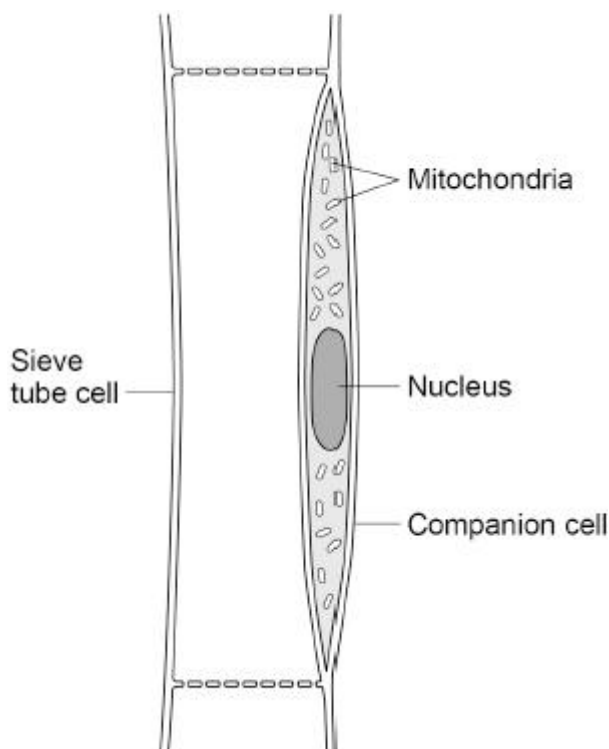
- (b) Dissolved sugars are moved through a plant in phloem tissue.

What is the name of the process that moves dissolved sugars through phloem tissue?

(1)

Phloem tissue is made of sieve tube cells and companion cells.

The figure below shows a section of phloem tissue.



- (c) Explain **one** way **sieve tube cells** are specialised for their function.

Use the figure above.

(2)

- (d) What does the structure of the companion cells suggest about the process that moves dissolved sugars through the phloem tissue?

Give a reason for your answer.

Use the figure above.

(2)

- (e) Describe why it is important that dissolved sugars are moved both upwards **and** downwards in a plant.

(3)

(Total 12 marks)