1 Yeast can be used to make beer. This process takes place in anaerobic conditions.

(a) (i) Name the group of organisms that includes yeast.

(1)

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(ii) What is meant by the term **anaerobic**?

(1)

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(iii) Write the word equation for anaerobic respiration in yeast.

(2)

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(b) After the beer is made it is put into sterile bottles.

(i) Describe w the bottles can be sterilised.

(1)

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(ii) Why is it important to use sterile bottles?

(1)

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(c) The food source for the yeast cells comes from barley grains that are allowed to germinate.

(i) Name the enzyme that digests the starch in the barley.

(1)

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(ii) Name the substance produced when the starch is digested.

(1)

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(d) During the production of beer the number of live yeast cells initially increases, but then decreases towards the end of the process.

Explain why the number of live yeast cells decreases towards the end of the process.

(2)

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(Total for Question = 10 marks)

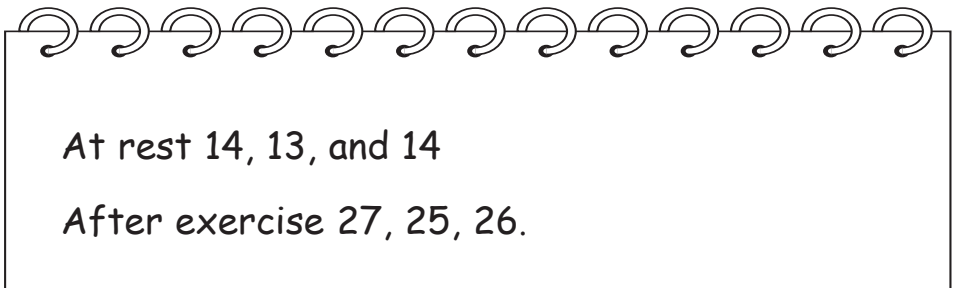
2 A group of students investigate the effect of exercise on breathing rate.

They measure their breathing rate at rest by counting breaths per minute.

They then exercise by running on the spot.

After exercise they measure their breathing rate by counting breaths per minute.

These are their results.



(a) Display these results in a table.

(2)

(b) Explain why breathing rate is higher after exercise.

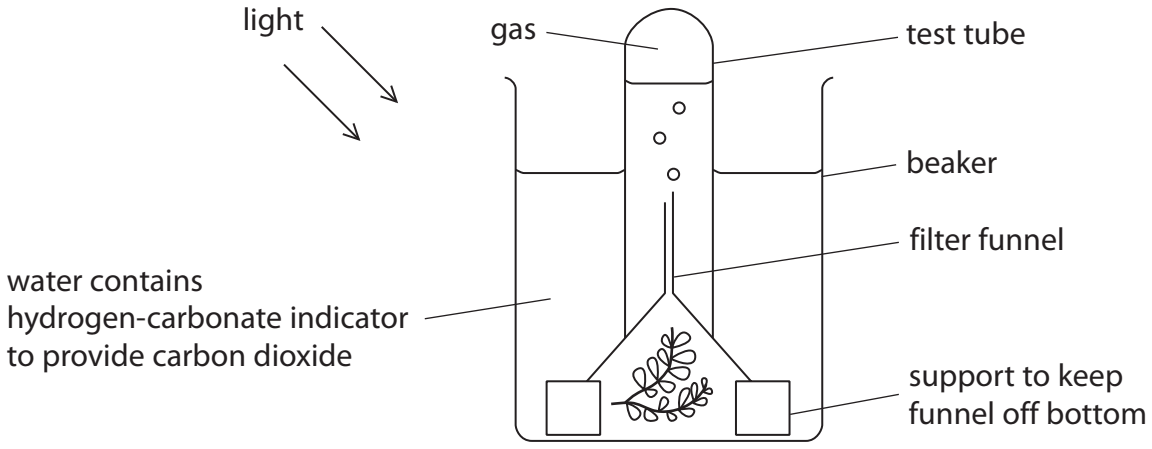
(4)

(c) Explain how the students could improve their investigation.

(2)

(Total for Question = 8 marks)

3 A student investigated the effect of red, green and blue light on the rate of oxygen production of a water plant. She used the apparatus shown.



The student shone different coloured lights on the plant. She measured the rate of oxygen production, for each colour, by counting the number of bubbles released per minute.

The results are shown in the table.

Reading	Rate of oxygen production in bubbles released per minute		
	Red light	Green light	Blue light
1	10	1	12
2	11	1	10
3	9	1	
Average	10	1	11

(a) Give two reasons why the data in the table are reliable.

(2)

1 .....

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2 .....

.....

(b) Suggest how the student could modify the apparatus to measure the rate of oxygen production more accurately.

(1)

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(c) Name the independent variable in this investigation.

(1)

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(d) The student changed the colour of the light but kept the intensity the same.

Give three other variables that she should keep the same in order to make the comparison of oxygen production valid.

(3)

1 .....

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2 .....

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3 .....

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(Total for Question 3 = 7 marks)

4 Yeast can respire anaerobically and is used to produce beer.

(a) Write the word equation for anaerobic respiration in yeast.

(2)

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(b) Describe a test you could use to identify the gas produced when yeast respires anaerobically.

(2)

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(Total for Question = 4 marks)

5 This warning appears on the side of a cigarette packet.

> Smoking seriously damages your health and those around you

(a) Describe how smoking damages the lungs.

(5)

(b) If a pregnant woman smokes cigarettes it will increase the risk of her producing a smaller baby. This is because cigarette smoke contains carbon monoxide.

Suggest how carbon monoxide will increase the risk of producing a smaller baby.

(3)

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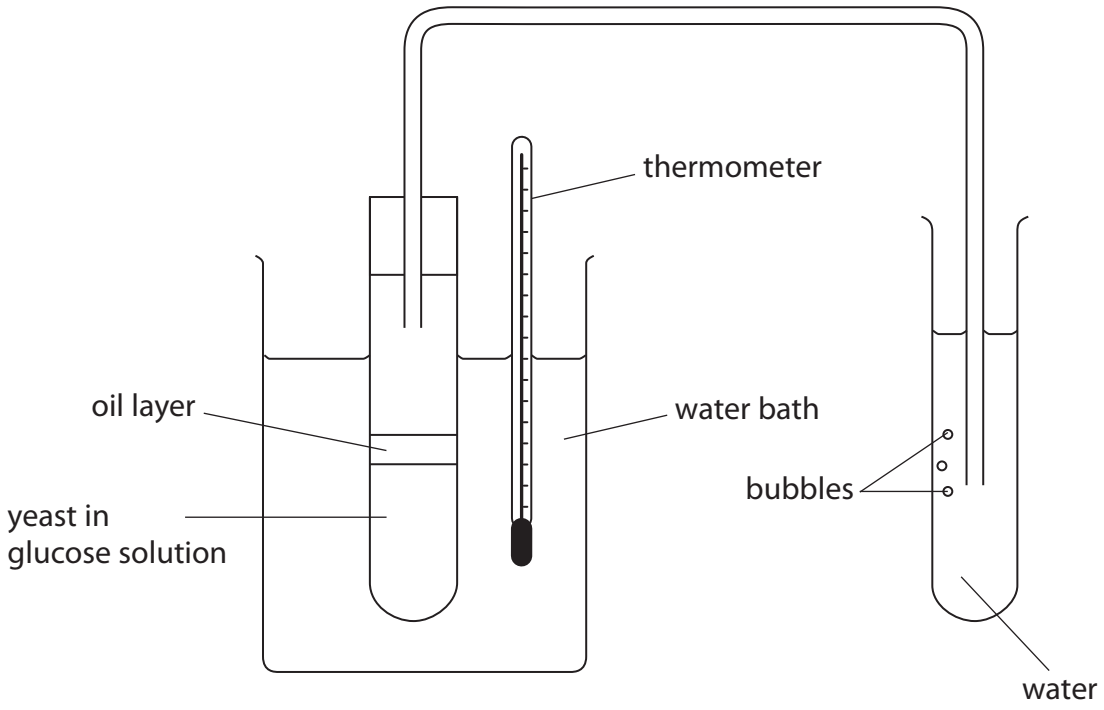
(Total for Question = 8 marks)

6 John wanted to investigate the effect of temperature on the rate of carbon dioxide production by yeast.

He set up this apparatus.



(a) The oil layer prevents the entry of air into the glucose solution.

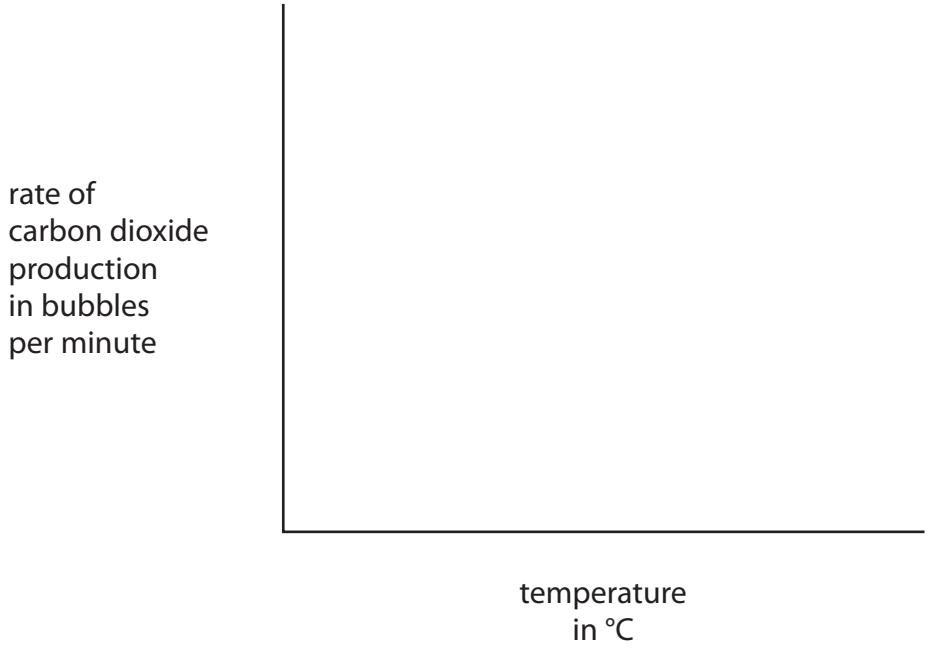
Explain why this is necessary.

(2)

(b) John varied the temperature of the water bath between 15 °C and 65 °C. He measured the rate of carbon dioxide production by counting the number of bubbles per minute.

(i) Sketch the shape of the graph that John would obtain on the axes below.

(3)



(ii) Give the dependent variable in this experiment.

(1)

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(iii) Give the independent variable in this experiment.

(1)

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(c) Give **two** variables that John would need to keep the same in his experiment.

(2)

1 .....

2 .....

(d) Suggest **one** way that John could improve the reliability of his experiment.

(1)

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(e) Suggest how John could improve the accuracy of his measurement of the rate of carbon dioxide production.

(1)

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(f) Yeast is used to produce beer.

Write the word equation for the respiration of yeast that occurs during the production of beer.

(3)

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(Total for Question = 14 marks)