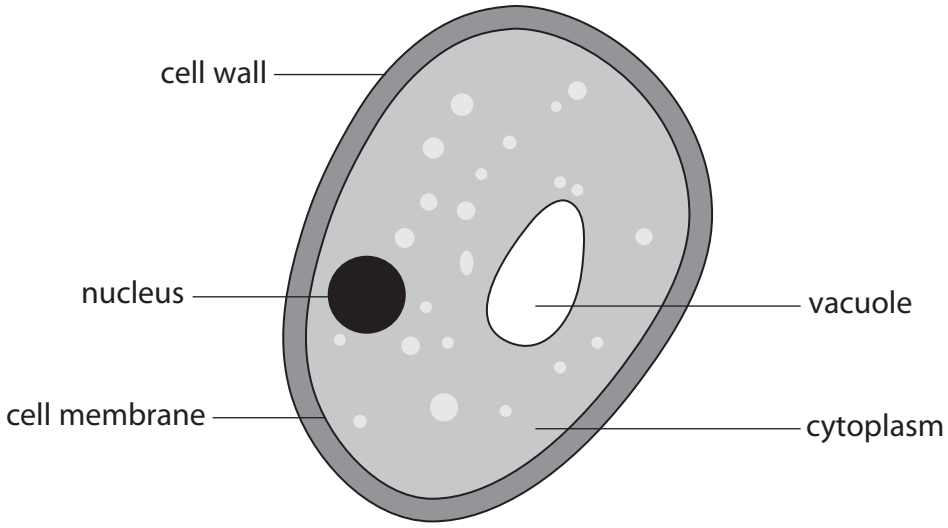
1 Yeasts are microorganisms that are used in the brewing and baking industries.

The diagram shows a yeast cell.



(a) (i) State **two** ways in which the structure of this yeast cell differs from the structure of a bacterial cell.

(2)

1 .....

.....

2 .....

.....

(ii) Plant cells can produce glucose.

Suggest why yeast cells cannot produce glucose.

(1)

.....

.....

(b) The table shows the number of different components found in the blood of a healthy person and the blood of two other people.

	number of components per dm^3 of blood		
component of blood	**healthy person**	**person A**	**person B**
red blood cells	5×10^{12}	6×10^{12}	3×10^{12}
white blood cells	7×10^{9}	5×10^{10}	8×10^{10}
platelets	3×10^{11}	3×10^{11}	3×10^{11}

(i) Calculate the difference in the number of white blood cells per dm^3 of blood between the healthy person and person A.

(2)

answer = ...

(ii) Describe the functions of white blood cells.

(2)

.....

.....

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.....

(iii) Person B has a low number of red blood cells compared to the healthy person.

Suggest an effect this may have on person B.

(1)

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.....

(Total for Question 1 = 8 marks)

2 Diffusion, active transport and osmosis can be used to move substances into and out of cells.

(a) A student was investigating osmosis in potato cubes.

He used the following method:

cut a potato into equal-sized cubes

- record the mass of each potato cube
- place each potato cube into different concentrations of salt solution
- remove the potato cubes after 30 minutes
- dry the potato cubes and record the final mass of each cube.

He plots his results on a graph shown in Figure 6.

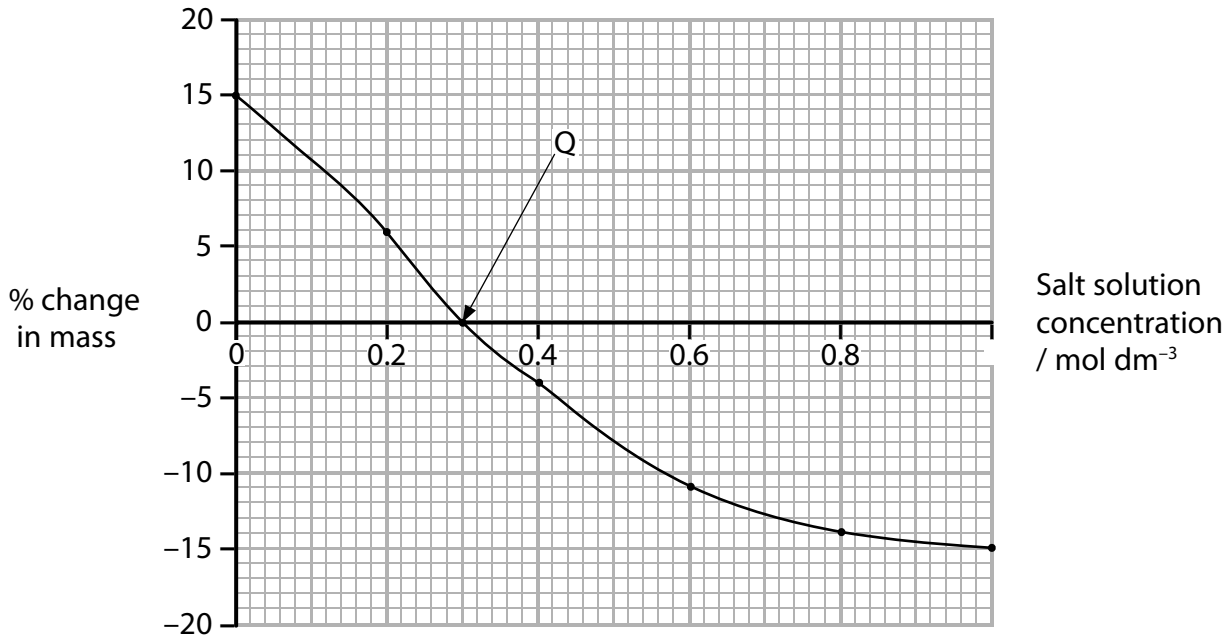

Figure 6

The method controls a number of variables.

(i) Name **one** other variable that needs to be controlled during the student's investigation.

(1)

.....

.....

(ii) Give a reason why the potato cube must be dried.

(1)

.....

.....

(iii) Explain the conclusion that can be made about point Q on Figure 6.

(2)

.....

.....

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.....

(iv) Give one way that the student could obtain more data to increase the accuracy of point Q.

(1)

.....

.....

(b) Osmosis is one method that single-celled organisms, such as bacteria, use to obtain molecules from their environment.

Which of the following is a correct description of a process involving the transport of molecules?

(1)

☒ **A** Diffusion is used to transport molecules against the concentration gradient

☒ **B** Active transport is used to obtain molecules in a low concentration environment

☒ **C** Active transport moves substances along the concentration gradient

☒ **D** Diffusion uses energy to transport molecules into cells

(c) Figure 7 shows some *Vibrio cholerae*, the bacteria that cause cholera.

Magnification ×8000

(Source: Corbis)

Figure 7

The length of one flagellum on Figure 7 is 68 mm.

Calculate the length of the flagellum in μm.

(3)

..... μm

(Total for Question 2 = 9 marks)