**Q1.**

A student investigated the effect of different concentrations of sugar solution on pieces of potato. This is the method used.

1.   Cut three pieces of potato to the same length.

2.   Dry each piece on a paper towel.

3.   Weigh each piece.

4.   Place each piece in a different concentration of sugar solution.

5.   Leave all three pieces for 2 hours.

6.   Remove the three pieces of potato from the solutions.

7.   Dry each piece on a paper towel.

8.   Measure the length and mass of each piece of potato.

**Figure 1** shows how the investigation was set up.

**Figure 1: **

(a)  Why did the student dry each piece of potato before weighing it?

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(b)  What **two** changes would you expect in the potato in **tube A** after 2 hours?

Tick **two** boxes.

|  |  |
| --- | --- |
| Breaks into pieces |  |
| Decrease in hardness |  |
| Decrease in size |  |
| Increase in mass |  |
| Increase in length |  |

**(2)**

(c)  Complete the sentences.

Water moves into and out of cells by a process called \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_ .

Water would move \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_ the potato cells in **tube A**.

The solution outside the potato in **tube A** is at a \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_

concentration than the solution inside the potato cells. **(3)**

(d)  The potato in **tube B** did not change.

Give **one** conclusion that can be made from this observation.

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(e)  **Figure 2** shows the root of a germinating seed.

**Figure 2: **

Describe **two** ways the root is adapted to absorb water efficiently.

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**(Total 9 marks)**

**Q2.**

Diffusion is an important process in animals and plants.

The movement of many substances into and out of cells occurs by diffusion.

Describe why diffusion is important to animals and plants.

In your answer you should refer to:

•        animals

•        plants

•        examples of the diffusion of named substances.

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**(Total 6 marks)**

**Q3.**

(a)     The diagram shows four ways in which molecules may move into and out of a cell. The dots show the concentration of molecules.



The cell is respiring aerobically.
Which arrow, **A**, **B**, **C** or **D**, represents:

(i)      movement of oxygen molecules;                 \_\_\_\_\_\_\_\_\_\_

(ii)     movement of carbon dioxide molecules?     \_\_\_\_\_\_\_\_\_\_

**(2)**

(b)     Name the process by which these gases move into and out of the cell.

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**(1)**

(c)     Which arrow, **A**, **B**, **C** or **D**, represents the active uptake of sugar molecules by the cell?

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Explain the reason for your answer.

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**(2)**

**(Total 5 marks)**