

Name of the Student: _____

Max. Marks : 20 Marks

Time : 20 Minutes

Q1.

Cells, tissues and organs are adapted to take in different substances and get rid of different substances.

The table shows the concentration of four ions outside cells and inside cells.

Ion	Concentration outside cells in mmol per dm ³	Concentration inside cells in mmol per dm ³
Sodium	140	9
Potassium	7	138
Calcium	2	27
Chloride	118	3

- (a) Use information from the table above to complete the following sentences.

Sodium ions will move into cells by the process

of _____.

Potassium ions will move into cells by the process

of _____.

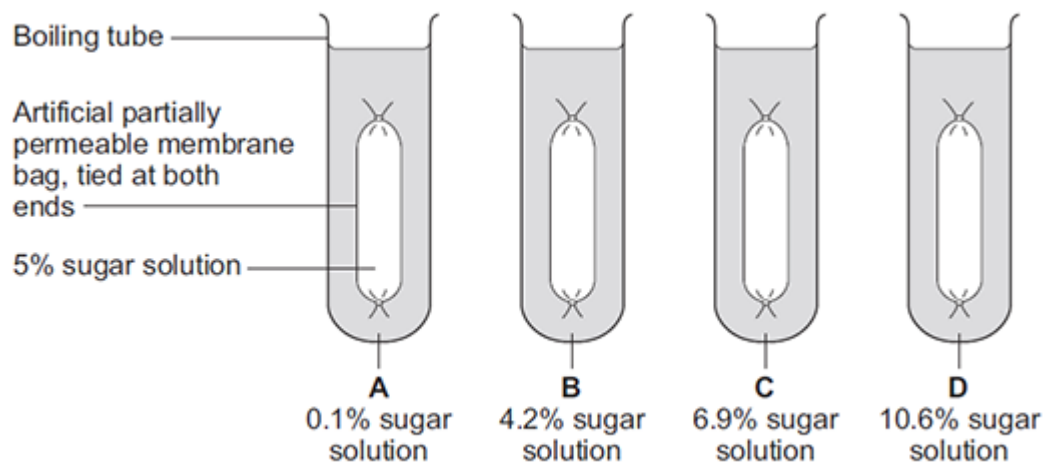
(2)

- (b) Some students investigated the effect of the different concentrations of sugar in four drinks, **A**, **B**, **C** and **D**, on the movement of water across a partially permeable membrane.

The students:

- made four bags from artificial partially permeable membrane
- put equal volumes of 5% sugar solution in each bag
- weighed each bag containing the sugar solution
- placed one bag in each of the drinks, **A**, **B**, **C** and **D**
- after 20 minutes removed the bags containing the sugar solution and weighed them again.

The diagram below shows how they set up the investigation.



- (i) The bag in drink **A** got heavier after 20 minutes.

Explain why.

(3)

- (ii) In which drink, **A**, **B**, **C** or **D**, would you expect the bag to show the smallest change in mass?

Tick (✓) **one** box.

A ☐ **B** ☐ **C** ☐ **D** ☐

(1)

- (iii) Explain why you think the bag you chose in part **(b)(ii)** would show the smallest change.

(2)

(Total 8 marks)

Q2.

- (a) In humans there are two types of cell division: **mitosis** and **meiosis**.

The table below gives statements about cell division.

Tick (✓) **one** box in each row to show if the statement is true for mitosis only, for meiosis only, or for both mitosis **and** meiosis.

The first row has been done for you.

Statement	Mitosis only	Meiosis only	Both mitosis and meiosis
How cells are replaced	✓		
How gametes are made			
How a fertilised egg undergoes cell division			
How copies of the genetic information are made			
How genetically identical cells are produced			

(4)

- (b) Stem cells can be taken from human embryos.

In therapeutic cloning, an embryo is produced that has the same genes as the patient.

- (i) Name **one** source of human stem cells, other than human embryos.

(1)

- (ii) Stem cells from embryos can be transplanted into patients for medical treatment.

Give **one** advantage of using stem cells from embryos, compared with cells from the source you named in part (i).

(1)

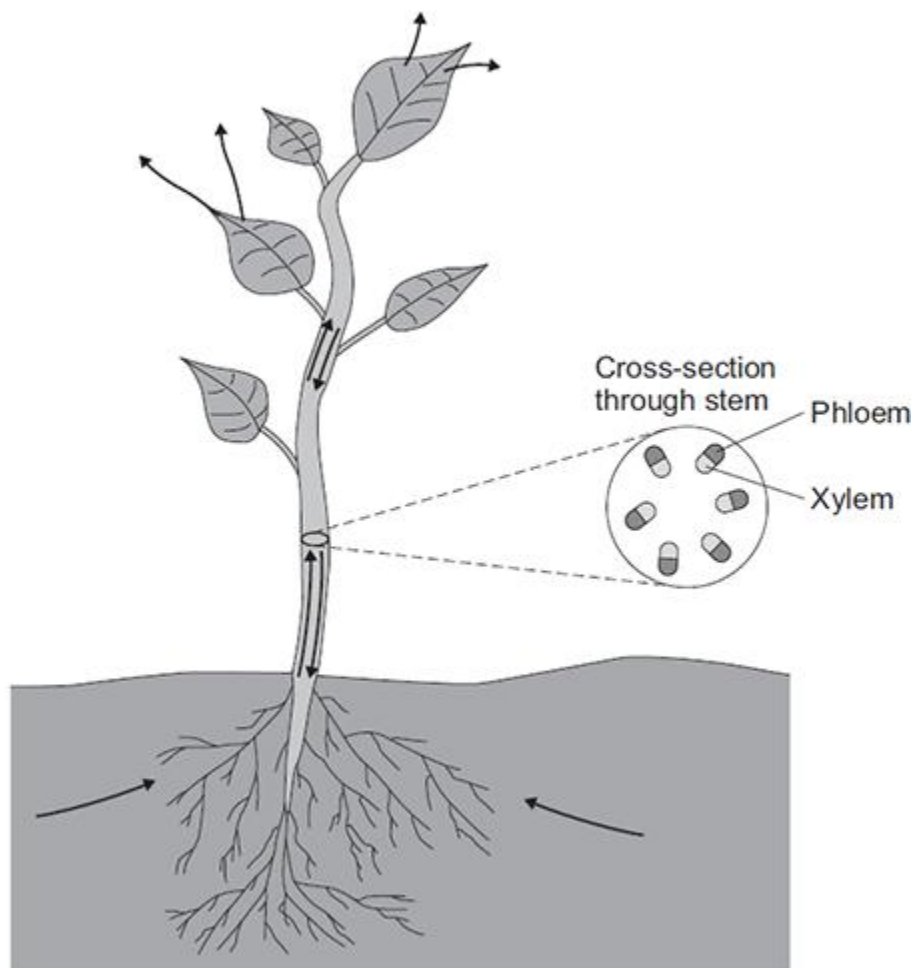
(Total 6 marks)

Q3.

In this question you will be assessed on using good English, organising information clearly and using specialist terms where appropriate.

Plants transport many substances between their leaves and roots.

The diagram below shows the direction of movement of substances through a plant.



Describe how **ions**, **water** and **sugar** are obtained and transported through plants.

In your answer you should refer to materials moving upwards in a plant and to materials moving downwards in a plant.

(Total 6 marks)