AQA A-LEVEL · 7402

BIOLOGY



EXAM QUESTION PACK

3.1.8 INORGANIC IONS

SCORE	PERCENTAGE
/43	%

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Q1.

Water and inorganic ions have important biological functions within cells.

(a) Give **two** properties of water that are important in the cytoplasm of cells.
For each property of water, explain its importance in the cytoplasm.

Property 1_____

Biological importance within cells_____

_____

_____

Property 2_____

Biological importance within cells_____

_____

_____

(4)

(b) Other than sodium, name **one** inorganic ion and give **one** example of its biological importance in a cell.

Name of inorganic ion_____

Biological importance_____

_____

_____

(2)

(c) Compare and contrast the processes by which water and inorganic ions enter cells.

_____

_____

_____

_____

_____

_____

_____

(3)

(Total 9 marks)

Q2.

(a) Discs of carrot were placed in a solution containing potassium ions (K^+). The concentration of oxygen in air bubbled through the solution was changed and the rates of respiration and uptake of potassium ions were measured. The results are shown in the table.

Concentration of oxygen / %	Rate of respiration / arbitrary units	Rate of uptake of potassium ions / arbitrary units
2.7	31	29
12.2	69	72
20.8	90	80

Describe and explain the link between oxygen concentration, rate of respiration and rate of uptake of potassium ions.

_____

_____

_____

_____

_____

_____

_____

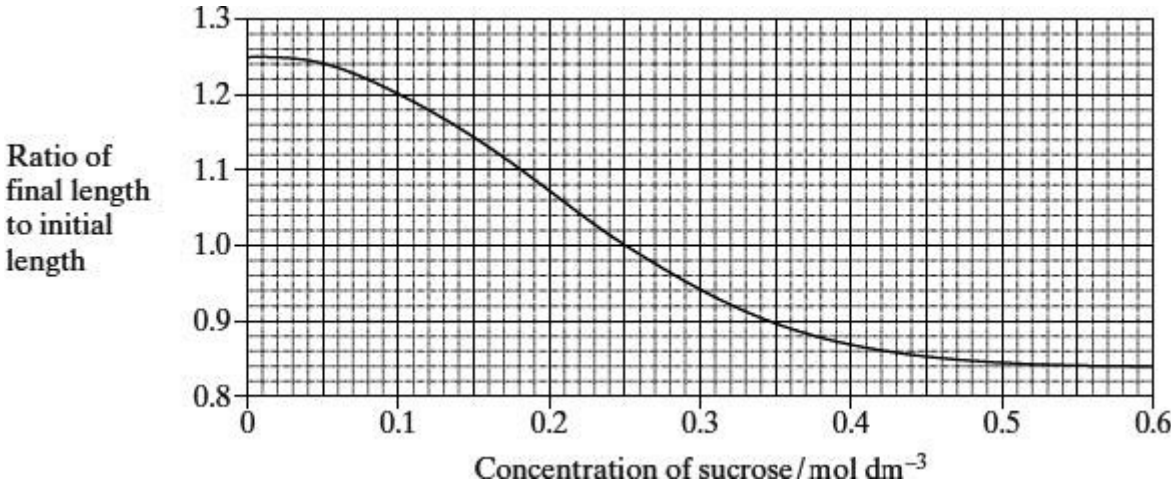
_____

_____

_____

(4)

(b) Cylinders of potato were cut using a cork borer. Their initial lengths were measured. Each cylinder was then put in a different concentration of sucrose solution for 12 hours. The graph shows the changes in length of the potato cylinders in the different sugar solutions.



(i) In what concentration of sucrose did the length of the potato cylinder remain the same?

_____

(1)

(ii) The initial length of the potato cylinder in the solution of concentration 0.1 mol dm^{-3} was 90 mm. Calculate its final length. Show your working.

Final length = _____ mm

(2)

(iii) Explain the change in length which occurs in a sucrose solution of concentration 0.5 mol dm^{-3}.

_____

_____

_____

_____

(2)

(Total 9 marks)

Q3.

Inorganic ions include those of sodium, phosphorus and hydrogen. Write an essay to describe how these and other inorganic ions are used in living organisms.

(Total 25 marks)