

CELL PHYSIOLOGY

(Osmosis, Diffusion & Active Transport)

KCSE QUICK REVISION

*Compilation of Possible Questions in Biology Likely to be
Examined in KCSE.*

*A Special Analysis of Prediction Questions that may be Tested in KCSE from this
Topic in Form 1.*

BIOLOGY

SERIES 1

For Marking Schemes

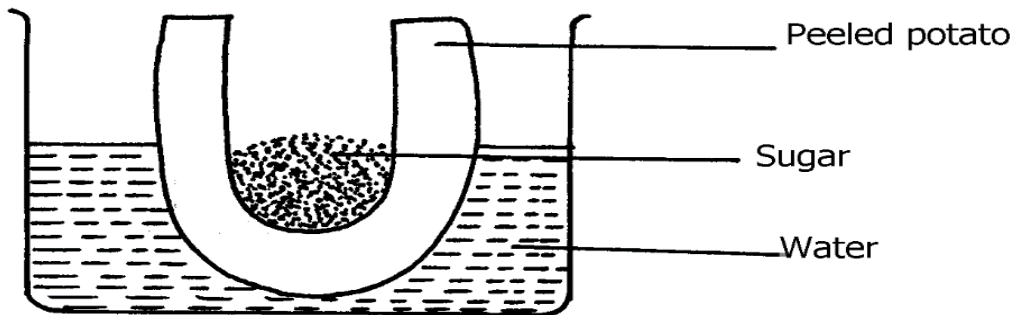
Mr Isaboke **0746 222 000 / 0742 999 000**

MWALIMU CONSULTANCY

CELL PHYSIOLOGY

(Osmosis, Diffusion and Active Transport)

- Two equal strips **A** and **B** were from a potato whose cell was 30% of sugar. The strip **A** was placed in a solution of 10% sugar concentration while **B** was placed in 50% sugar concentration
 - What change was expected in strip **A** and **B**
 - Account for the change in strip **A**
- An experiment was set-up as shown below and left for one hour

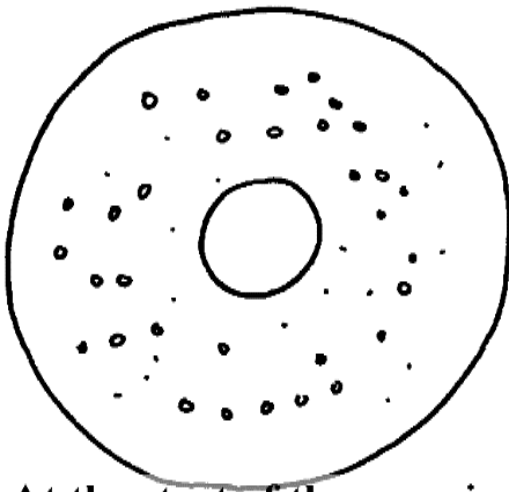


- State the expected result at the end of one hour
 - Explain the observations made in this experiment
- State what would happen in each of the following:-
 - A plant cell placed in: -
 - Strong salt solution
 - Distilled water
 - State **three** physiological processes that are involved in movement of substances across the cell membrane
 - Potato cylinders were weighed and kept in distilled water overnight. They were then reweighed.

2.5 g	2.4g	2.7g	3.0 g	3.1 g	3.2g
At the beginning of the Experiment.			At the end of the experiment		

 - Calculate the average mass of a potato cylinders after reweighing. Show your working.
 - Explain why mass of the cylinders had increased.

6. The diagrams below show a red blood cell that was subjected to a certain treatment.

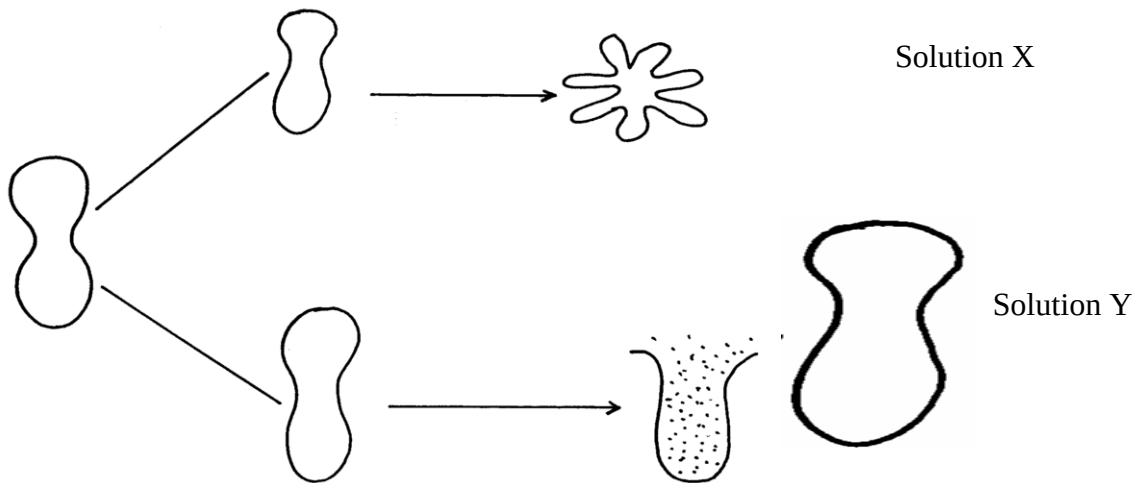


At the start of the experiment



At the end of the experiment

- a) Account for the shape of the cell at the end of the experiment.
b) Draw a diagram to illustrate how a plant cell would appear if subjected to the same treatment
7. The diagram below shows the results obtained when red blood cells are placed in different solution:

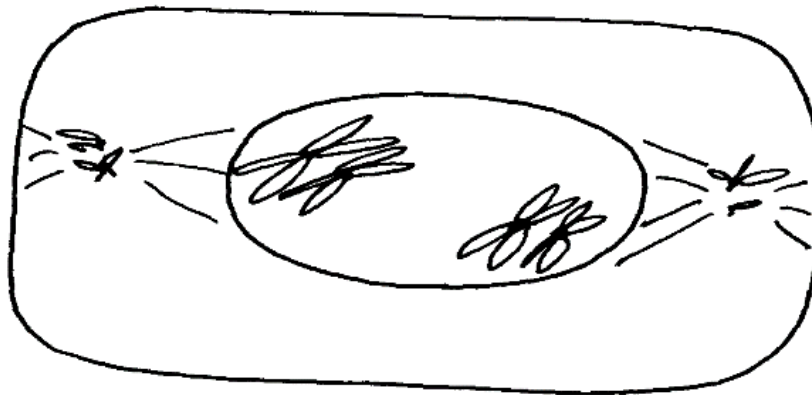


- (a) What name is given to the process that occurs when the cell is placed in solution Y?
(b) Describe the process that would occur in a plant cell when placed in a similar solution as that of solution X

8. The figure below shows the results obtained when red blood cells are put in different solutions:-

Placed in	Placed in
solution	solution
B	A

- (a) What is the name given to the process that occurs when the cell is put into solution **B**?
- (b) Compare the results obtained when the cell is put in solution **B** to the results that would be obtained if a plant cell was put in the same solution
9. Briefly state **two** adaptation for each of the following cells to their functions
- (i) Spermatozoon
 - (ii) Palisade mesophyll cell
10. The diagram below represents a cell at a certain stage in meiotic cell division



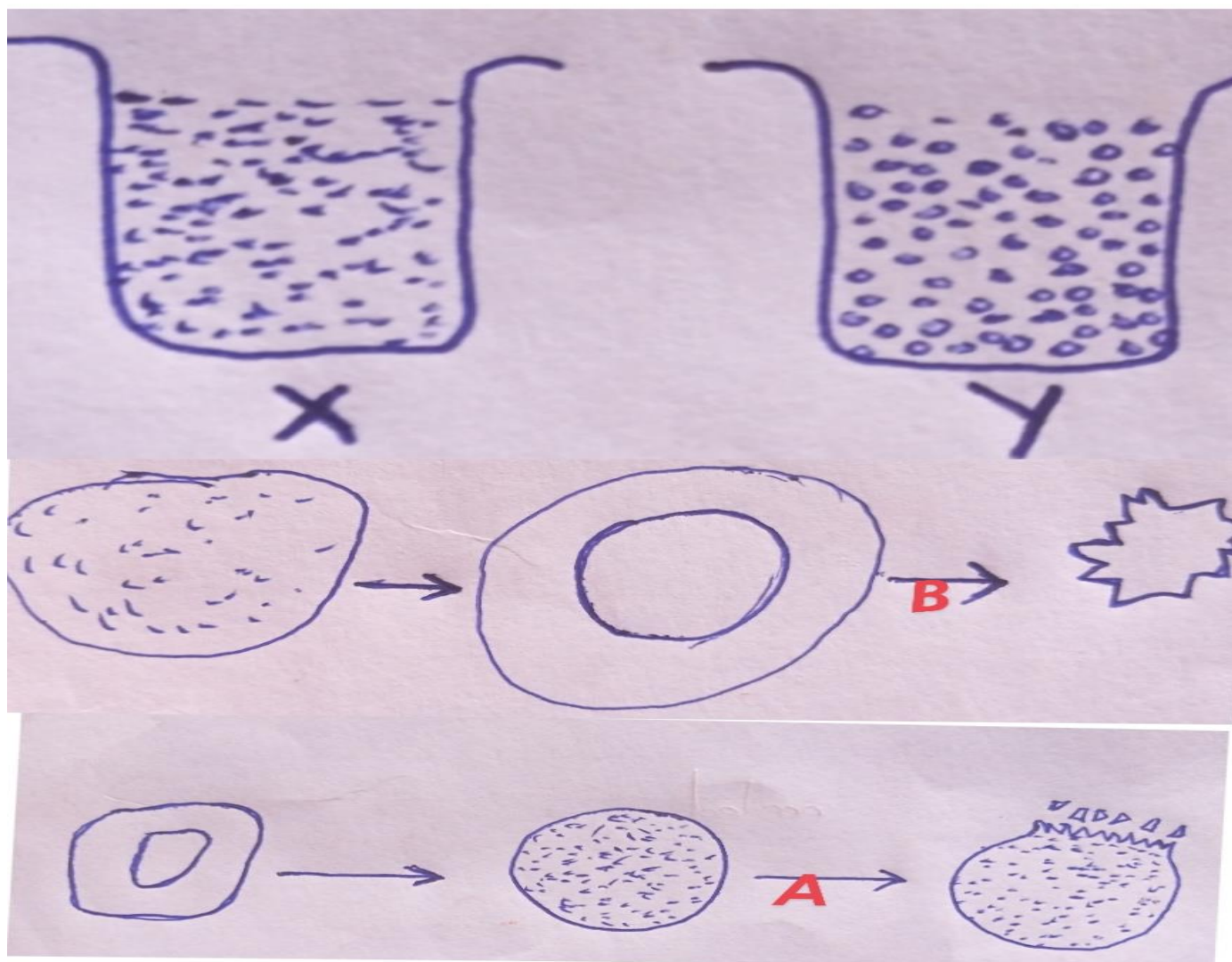
- a) Name the stage at which the cell drawn above represents
- b) Give a distinguishing reason for your answer in **21(a)** above
- c) State any **two** differences between mitosis and meiosis
11. What are **two** differences between tropisms and tactic movement

12. An experiment was carried out to investigate the effect of different concentrations of sodium chloride on human red blood cells. Equal amounts of blood were added to equal volumes of the salt solution but of different concentrations. The results are shown in the table below:

Set-up	Sodium chloride concentration	Number of red blood cells	
		At start of experiment	At the end of the experiment
A	0.9%	Normal	No change in number
B	0.3%	Normal	Fewer in number

- (a) Account for the results in the set-up
- (b) If the experiment was repeated using 1.4% sodium chloride solution, state the expected results with reference to:
- (i) the number of red blood cells
 - (ii) the appearance of red blood cells if viewed under the microscope
13. Name support tissues in plants characterized by the following
- (i) Cells being turgid
 - (ii) Cells being thickened by cellulose
 - (iii) Cells being thickened by lignin

14. The diagram below illustrates the behaviour of red blood cells when placed into two different solutions X and Y.



- (a) Suggest the nature of solutions X and Y.
- (b) Name the process A and B.
- (c) What would happen to normal blood cell if it were placed in a solution isotonic.

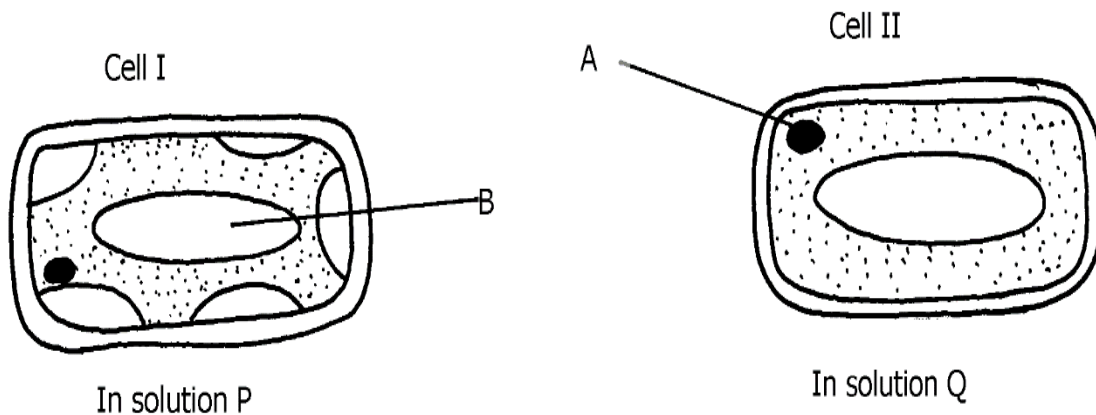
15. Name **two** plant processes in which diffusion plays an important role

16. Two fresh potato cylinders of equal length were placed one in distilled water and the other in concentrated sucrose solution:

- (a) Account for the change in length of the cylinder in:

- (i) Distilled water
- (ii) Sucrose solution
- (b) (i) What would be the result in terms of length if a boiled potato was used?
- (ii) Explain your answer in **(b)(i)** Above
- (c) State **two** uses of the physiological process being demonstrated in the experiment

17 The two cells shown below are obtained from two different potato cylinders which were immersed in two different solutions **P** and **Q**.



- a) i) Name the structure labelled **A**.
- ii) State the function of structure **B**.
- b) If eight of cell I were observed across the diameter of the field of view of 0.5 mm. Work out the actual diameters of each cell in micrometers.
- c) Suggest the identity of the solution **Q**.
- d) Account for the change in cell I above.
- e) State any **one** importance of the physiological process being demonstrated above in animals.
- (e) Suggest a suitable control for this experiment

For Marking Schemes/Answers

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