

Uva Wellassa University, Sri Lanka
End Semester Examination – June 2009
SCT 211-1 General Physiology



Time: One (01) hour

Total 06 Questions

Answer four (04) questions including question No 2.

1. (a). State the differences between facilitated diffusion and bulk diffusion

(5marks)

- (b). What is cavitation?

(3marks)

- (c). In order to regulate the quantity and the type of minerals, there is a special anatomical arrangement in the root cells. Explain the regulation of water transport through root (make suitable drawings)

(17 marks)

2. Second year students of a certain university had to design an experiment for their 1st semester practical assessment. They had a freedom to select any kind of experiment related to plant physiology. Therefore they selected an experiment related to osmosis. The experiment and the data are as follows

First they isolated an onion root cell (solute potential is known $\psi_s = -0.532\text{MPa}$) and put it in to 0.1M NaCl solution ($i=2$). At the equilibrium the cell was transferred in to a certain solution (con. X, $i=1$) and kept the cell until it reached to incipient plasmolysis stage. At the incipient plasmolysis stage (assume that at the incipient plasmolysis stage, cell was in equilibrium with the solution) the cell was taken out from the solution and put again in to pure water container.

$$\Psi_s = -miRT$$

$$(R=8.314 \text{ cm}^3 \cdot \text{MPa} \cdot \text{K}^{-1} \cdot \text{mol}^{-1}, \text{ temperature} = 25^\circ\text{C})$$

- (a). What is the water potential (ψ_w) of the cell after applying in to 0.1 M NaCl solution?
- (b). Calculate ψ_p of the cell at the equilibrium with 0.1M NaCl solution.
- (c). Calculate the concentration of the second solution (con. X)
- (d). What is the water potential (ψ_w) of the cell after putting in to pure water container?

(25marks)

3. (a). Name the most fundamental three embryonic tissue germ layers and state where they are located

(6marks)

- (b). Sketch a neuron cell and label completely

(9marks)

- (c). What are the structural adaptations of fluid feeders that facilitate their feeding habit?

(10 marks)

4. (a). What are antenna complexes?

(3marks)

- (b). State the first electron acceptor of photosystem II

(2 marks)

- (c). Briefly explain the C4 photosynthesis pathway by giving suitable diagrams

(20 marks)

- (a). What is the water potential (ψ_w) of the cell after applying in to 0.1 M NaCl solution?
- (b). Calculate ψ_p of the cell at the equilibrium with 0.1M NaCl solution.
- (c). Calculate the concentration of the second solution (con. X)
- (d). What is the water potential (ψ_w) of the cell after putting in to pure water container?

(25marks)

3. (a). Name the most fundamental three embryonic tissue germ layers and state where they are located

(6marks)

- (b). Sketch a neuron cell and label completely

(9marks)

- (c). What are the structural adaptations of fluid feeders that facilitate their feeding habit?

(10 marks)

4. (a). What are antenna complexes?

(3marks)

- (b). State the first electron acceptor of photosystem II

(2 marks)

- (c). Briefly explain the C4 photosynthesis pathway by giving suitable diagrams

(20 marks)

5. Write short notes on followings

- (a). Cyclic photophosphorylation

(8 marks)

- (b). Sun and shade leaves

(8marks)

- (c). CAM plants

(9marks)

6. (a). State the differences between phloem translocation and xylem transportation

(6marks)

- (b). What is the function of companion cell?

(2marks)

- (c). Briefly explain the pressure flow hypothesis

(17 marks)