

THE OPEN UNIVERSITY OF SRI LANKA

B.Sc./B.Ed. DEGREE PROGRAMME – LEVEL 04

FINAL EXAMINATION – 2006/2007

BOTANY

BTU 2201/BTE 4201 – PLANT PHYSIOLOGY (PAPER I)

DURATION : TWO AND A HALF (2 ½) HOURS



DATE : 21.06.2007

TIME: 10.00 a.m. – 12.30 p.m.

ANSWER ANY FOUR(04) OF THE FOLLOWING QUESTIONS.

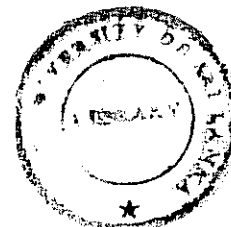
01. a) Explain the concept of “water potential” in relation to a plant cell.
- b) Cells in a segment of plant tissue have an average pressure potential of 300 kPa and an average osmotic potential of – 600 kPa.

How will the volume of this tissue change if it is placed in

- i) a solution of osmotic potential – 300 kPa?
- ii) a solution of osmotic potential – 600 kPa?

02. Write short notes on the following.

- a) Hydrogen bonds between water molecules.
- b) Incipient plasmolysis.
- c) Permanent wilting percentage of a soil.
- d) Cation exchange capacity of a soil.



03. a) Name the elements that are essential for green plants.
- b) What criteria are used to determine the essentiality of an element?
- c) What is meant by “the critical concentration” of an element?
- d) Explain the importance of using critical concentrations of elements in planning fertilizer schedules in the cultivation of crop plants.

04. a) Briefly describe the experiments performed to demonstrate that translocation of carbon assimilates takes place in the phloem.
- b) Describe the hypothesis formulated by Ernst Munch to explain phloem translocation.
05. a) Describe the Fluid Mosaic model of biological membranes.
- b) Comment on the following statements.
- i. The membrane is more like a fluid than a solid.
  - ii. The membrane is structurally and functionally asymmetric.
- c) What are the functions of biological membranes.
06. Write briefly on the following.
- a) Mycorrhizae and mineral nutrition in plants.
  - b) Transpiration and its role in plants.

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