CONTINUOUS ASSESSEMENT
(TRANSPORT IN PLANTS)

2 Hour 30 minutes

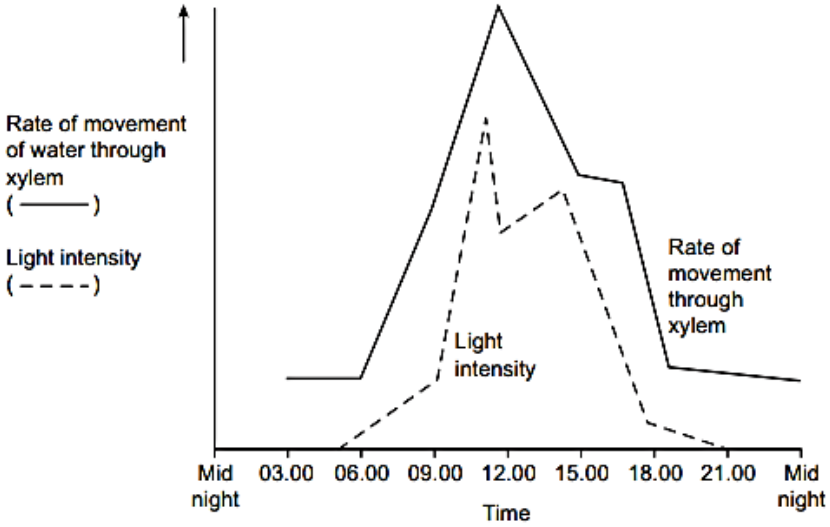
INSTRUCTIONS TO CANDIDATES:

Attempt **all** *questions.*

Candidates are advised to read the questions carefully, organize their answers and present them precisely and logically, illustrating with well labelled diagrams where necessary.

SECTION A (40 MARKS)

1. The graph in the figure below shows the rates of water movement through the xylem of a twig from a tree and light intensity over a 24-hour period. Study the figure and answer the questions that follow.



(a) Describe the;

(i) Relationship between the rate of water movement through the xylem and light intensity. (**03 marks**)

(ii) Changes in the rate of water movement through the xylem over the 24-hour period. (**07 marks**)

(b) Explain the changes in the rate of water movement through the xylem over the 24-hour period. (**10 marks**)

(c) Explain

(i) the difference in the diameter of the tree trunk on which the twig had been growing at 1200 hours and 0300hours. (**05 marks**)

(ii) how the xylem is adapted for movement of water up the trunk of the tree. (**07 marks**)

(d) Describe **four** environmental factors that affect rate of water movement through the xylem other than that demonstrated on the graph in the figure above. (**08marks)**

SECTION B (40 MARKS)

2. (a) Explain how water moves from the soil into the xylem cell of the root. (**10 marks**)

(b) (i) Describe the role of the endodermis in the movement of water across the root. (**06 marks**)

(ii) Outline evidences which suggests that ion uptake is an active process. (**04 marks**)

3. (a) (i) Describe how sugars produced during photosynthesis in the leaves are transported to the roots by mass flow. (**10 marks**)

(ii) State **four** reasons why mass flow hypothesis cannot fully explain translocation. (**04 marks**)

(b) How is the structure of the phloem sieve tube related to its function? (**06 marks**)

4. (a) Explain how stomatal opening and closure occurs according to;

(i) Starch ⇌ sugar interconversion. (**08 marks**)

(ii) Photosynthetic theory. (**06 marks**)

(b) State the limitations of starch ⇌ sugar interconversion in explaining stomatal movement. (**03 marks**)

(c) How significant is stomata movements in plant productivity? (**03 marks**)

END