

Semester: IV of B.Sc. BOTANY

Class &amp; Div: S.Y.B.Sc. (A &amp; B)

Course Title &amp; Code: Plant Physiology (BOC 104)

Maximum Marks: 80 Date: 29/04/2023 Duration: 2 Hours Total No. of Pages: 02

- Instructions:** 1. All questions are compulsory; however, internal choice is available.  
 2. Figures to the right indicate maximum marks assigned to the question.  
 3. Draw appropriate labelled diagrams wherever necessary.

Q. I. Answer any six of the following:

(2 marks x 6 = 12)

- List the criteria for essentiality of elements.
- What is translocation of organic solutes?
- Describe any two properties of enzymes.
- Describe the structure of nitrogenase enzyme.
- Draw a neat diagram of a hydathode and label epithem.
- Describe the 'oxygenase' role of RuBisCO enzyme.
- Explain the harvesting of light by photosynthetic pigments.
- Comment on the linking reaction in respiration.

Q. II. Answer any five of the following:

(4 marks x 5 = 20)

- Explain the girdling experiment with the help of a neat labelled diagram.
- Explain allosteric inhibition.
- Elaborate on the mechanism of biological nitrogen fixation.
- Describe the structure of phytochrome.
- 'Water is very essential for all plants'. Justify.
- Write a note on the physiological roles of ethylene.
- Explain the acidification and deacidification reactions in CAM cycle.

Q. III. A. State the physiological roles and deficiency symptoms of any three macronutrients and three micronutrients.

(6)

OR

A. Explain how ion-pumps bring about the transport of ions across membranes in plants.

(6)

B. Explain the pressure flow model by Munch.

(6)

Q. IV. A. Explain the sucrose- $H^+$  symport mechanism of phloem loading.

(6)

OR

A. Give an account of the mode of enzyme action.

(6)

B. What is photoperiodism? Describe the different categories of plants based on photoperiod.

(6)

Q. V. A. What is plasmolysis? Explain the stages and significance of plasmolysis. (6)

OR

A. Explain the mechanism of opening and closing of stomata. (6)

B. Give an account on factors affecting transpiration. (6)

Q. VI. A. Draw a neat labelled diagram of the structure of the chloroplast. Add a note on any 4 differences between chlorophyll a and chlorophyll b. (6)

OR

A. Give the cyclic representation of the TCA cycle. (6)

B. What is non-cyclic photophosphorylation? Represent the path of the electron in non-cyclic photophosphorylation. (6)

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