CARMEL COLLEGE OF ARTS, SCIENCE & COMMERCE FOR WOMEN, NUVEM – GOA.

SEMESTER END EXAMINATION, JUNE 2022

Semester: **IV of B.Sc.** Subject: **BOTANY**
Course Title: **Plant Physiology** Course Code: **BOC 104**
Total Marks: **80** Date: **/06/2022** 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 x 6 = 12)**

1. List the criteria for essentiality of elements.
2. Define the term phloem sap.
3. Differentiate between competitive and non-competitive inhibitors.
4. Describe the structure of nitrogenase enzyme.
5. When a plant cell is placed in a hypertonic solution, it's protoplasm shrinks. Justify.
6. Give two points of difference between transpiration and guttation.
7. List the components of PSI and PSII
8. State the significance of photosynthesis.

Q. II. Answer **any five** of the following: **(4 x 5 = 20)**

1. Elaborate on secondary active transport and its mechanism.
2. Describe protoplasmic streaming hypothesis.
3. Explain allosteric inhibition.
4. Elaborate on the mechanism of biological nitrogen fixation.
5. Give a general account on importance of water for plants.
6. Explain the dual role of Rubisco enzyme.
7. Explain the mechanism of ATP synthesis.

Q. III. A. State the physiological roles and deficiency symptoms of any three macronutrients and three micronutrients. **(6)**

OR

A. Explain how ion-channels bring about the transport of ions across membranes in plants. **(6)**

B. Explain the mechanism of translocation through phloem based on Munch's mass flow hypothesis. **(6)**

Q. IV. A. Discuss the process of phloem loading. **(6)**

OR

A. Give an account of the mode of enzyme action. **(6)**

B. Explain nitrate assimilation. **(6)**

Q. V. A. Explain the mechanism of stomatal transpiration. **(6)**

OR

A. Discuss the factors affecting transpiration. **(6)**

B. Explain oxidative phosphorylation with a suitable diagram. **(6)**

Q. VI. A. Represent the electron flow in non-cyclic electron transport. Add a note on splitting of water. **(6)**

OR

A. List the reactions in the C_3 cycle. Add a note on its energy requirement. **(6)**

B. Represent the steps in Glycolysis pathway. Add a note on energy production in Glycolysis. **(6)**

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