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M.Sc. (Semester-II) Examination, July 2022

MICROBIOLOGY

(Plant Physiology)

Time Allowed : Three Hours

Maximum Marks : 70

Minimum Passing Marks : 25

Note : This question paper is divided in **four** sections. **All** sections are **compulsory**. Attempt questions as per instructions given in each section.

SECTION-A

(Objective Type Questions)

Note : Attempt **any ten** questions. Each question carries **1** mark. [10x1=10]

1.(A) Fill in the blanks :

(i) The positive charged ions that flow back to guard cells, from epidermal cells at the end of the day are_____.

(ii) Na-K pump is an example of_____transporter.

(iii) In photorespiration, glycolate converted into serine and carbon dioxide in_____.

(iv) In the C_4 pathway_____molecules combineds with carbon dioxide.

(v) Plant growth hormone that increase yield of sugar by increasing stem length in sugar can is_____.

(vi) Fruits in cold storage maintain flavour and taste for long time due to slower rate of_____.

(B) Multiple Choice Questions :

(vii) Root pressure develops due to :

(a) Increase transpiration

(b) Low osmotic potential in soil

(c) Passive absorption

(d) Active absorption

(viii) Which apparatus is used to measure root pressure ?

(a) Potometer

(b) Auxometer

(c) Potential meter

(d) Monometer

(ix) The most important forces for the ascent of sap in plant are :

(a) Imbibition and Capillary

(b) Suction and Cohesion

(c) Capillary and Root pressure

(d) Root pressure and Pulsation

(x) During the day, plants keep their :

(a) Stomata open

(b) Stomata close

(c) Phloem block

(d) Xylem block

(xi) Chemiosmotic theory of ATP synthesis in the chloroplast and mitochondria is based on :

(a) Protein gradient

(b) Accumulation of Mg^{++}

(c) Membrane potential

(d) Accumulation of Fe-S protein

(xii) A physiological response of plant to the duration of light and darkness is a :

(a) Daily routine cycle

(b) Biological rhythum

(c) Biological clock

(d) Photoperiodism

SECTION-B

(Very Short Answer Type Questions)

Note : Attempt **any five** questions. Each question carries **2** marks. (Word limit : **25-30** words) [5x2=10]

2. (i) Define transpiration pull.

(ii) Define cytochrome pump.

(iii) Explain chlorophylls.

(iv) What is CAM cycle ?

(v) Explain importance of plant alkaloids.

(vi) Explain long day and short day plant.

(vii) What is Red drop effect ?

SECTION-C

(Short Answer Type Questions)

Note : Attempt **any five** questions. Each question carries **4** marks. (Word limit : **250** words) [5x4=20]

3. (i) Explain carrier concept of absorption.

(ii) Discuss factors affecting transpiration.

(iii) Explain nitrogenous compounds and their importance.

(iv) Explain C_3 and C_4 plant.

(v) Explain photorespiration.

(vi) Discuss biosynthesis of flavonoids.

(vii) Explain seed dormancy.

SECTION-D

(Essay Type Questions)

Note : Attempt **any three** questions. Each question carries **10** marks. (Word limit : **500** words) [3x10=30]

4. (i) Discuss mineral absorption by plant with suitable examples.

(ii) Describe Z-scheme of photosynthesis.

(iii) Describe structure, types and mode of action of cytokinins.

(iv) Describe the mechanism of opening and closing of stomata.

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