

Roll No.

Total No. of Questions : 9]
(2042)

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**UG (CBCS) IInd Year Annual Examination
2095**

B.Sc. BOTANY

(Paper IV : Plant Physiology and Metabolism)
(DSC-IB)

Paper : BOTA 202

Time : 3 Hours]

[Maximum Marks : 50

Note :- Attempt *five* questions in all, selecting *one* question from each Part-B, C, D and E. Question No. 1 of Part-A is compulsory. Attempt all subparts of a question together.

Part-A

(Compulsory Question)

1. All parts of this question are compulsory.

(i) Complete the following equation :

$$\Psi_{\text{total}} = \Psi_s + \dots + \Psi_g + \Psi_m$$

(ii) Write the chemical formula of Chl *b*.

(iii) Name the plant growth regulator which can replace the requirement for vernalization.

CH-814

(1)

Turn Over

- (iv) Dark reaction of photosynthesis occurs in
- (v) Who coined the term enzyme ?
- (vi) Where does the Krebs cycle occur ?
- (a) Cytosol
 - (b) Chloroplast matrix
 - (c) Mitochondrial matrix
 - (d) Mitochondrial inter-membrane space
- (vii) Khaira disease of rice is caused by deficiency of :
- (a) Copper
 - (b) Molybdenum
 - (c) Zinc
 - (d) Manganese
- (viii) The transfer of photosynthates from mesophyll cells to sieve tube elements in the leaf is called as
- (a) Translocation
 - (b) Phloem loading
 - (c) Ascent of sap
 - (d) Symplastic transfer
- (ix) is essential for fruit ripening.
- (a) Auxins
 - (b) Cytokinin
 - (c) Ethylene
 - (d) Brassinosteroids

(x) The respiratory quotient (RQ) less than unity indicates that the respiratory substrate has oxygen content.

(a) Less

(b) More

(c) No

(d) None of these

1×10=10

Part-B

2. (a) Discuss the properties of water. What is the importance of water in plant life ?

(b) Define root pressure and guttation. Discuss the mechanism of guttation in plants.

5+5=10

Or

3. (a) Discuss the Malate or K^+ ion Pump hypothesis of stomatal opening and closing in plants.

(b) Discuss the roles of sulphur and phosphorus in plants. What are the symptoms plants develop in response to deficiency and excess of these elements ?

5+5=10

Part-C

4. (a) What is the composition of phloem sap ? Discuss the pressure flow model of translocation in phloem.

(b) Briefly discuss the cyclic and non-cyclic photophosphorylation in plants.

5+5=10

Or

5. Discuss the dark reaction of photosynthesis in C_3 plants. Enumerate the various factors which influence photosynthesis in plants. 10

Part-D

6. (a) What is Glycolysis ? Discuss the various steps in glycolytic pathway.
(b) Discuss the balance sheet of ATP in respiration. 7+3=10

Or

7. (a) Write a note on mechanism of enzyme catalysis.
(b) Discuss the mechanism of nitrate and ammonia assimilation in plants. 5+5=10

Part-E

8. (a) Write a note on the discovery and physiological roles of cytokinins in plants.
(b) Write a note on ethylene as a plant hormone. 6+4=10

Or

9. (a) What is Photoperiodism ? Classify the plants on the basis of their photoperiodic requirements.
(b) Discuss the structure and functions of phytochrome. 5+5=10