Sr. No. of Question Paper : 1563

Unique Paper Code : 42164401

Name of the Paper : Plant Physiology and

Name of the Course : B.Sc. (Programme) Life Sciences

Semester : IV

Duration : 3.5 Hours Maximum Marks : 75

Instructions for Candidates

1. Write your Roll No. on the top immediately on receipt of this question paper.
2. Only Five questions are to be attempted in all.
3. Question 1 is compulsory.
4. All questions carry equal marks.
5. Attempt all parts of the question together.
6. Illustrate your answers wherever possible.

P.T.O.

Q1. (a) *Fill in the blanks (any ten):* (1×10=10)

(i) RQ is defined as a ratio .....

(ii) .....is the first stable product of dark reaction.

(iii) Glyoxysomes contain enzymes for β- oxidation of .....

(iv) .....is the anti- ageing phytohormone.

(v) Mobilization of food reserves through α-amylase in barley seeds is due to the phytohormone .....

(vi) Photolysis of water in light reaction is associated with ..... ions

(vii) Letham is associated with the discovery of .....

(viii) The word enzyme was coined by .....

(ix) The occurrence of break in the continuity of water column in the xylem is known as .....

(x) The protein part of enzyme is called as.....

(xi) Blue Green Algae fix ..... directly from air to enhance fertility of crops.

(xii) The movement of water or solutes from cell to cell through cytoplasm with the help of plasmodesmata is called .....

(xiii) The process by which bacteria reduce nitrate to dinitrogen is known as .....

(b) Expand the following *(any five)*: (1×5=5)

(i) NAA (ii) SE-CC complex

(iii) PMF (iv) EDTA

(vii) CEC

Q2. Differentiate between *(any five)*: (3×5=15)

(i) C3 and C4 plants.

(ii) Aerobic respiration and Anaerobic respiration.

(iii) Oxidative Phosphorylation and Photophosphorylation

(iv) Competitive and non-competitive inhibition

(v) Coenzyme and cofactor

(vi) Carrier proteins and Channel proteins

(vii) V-type ATPase and P-type ATPase

Q3. (a) 'Photorespiration is a wasteful process in plants'. Comment. (5)

(b) Write an explanatory note on phytochrome. (5)

(c) Discuss the theory that best explains the mechanism of stomatal movements. (5)

Q4. (a) Give the discovery and enumerate the commercial applications of Auxins. (5)

(b) What is photoperiodism? Discuss three general categories of plants with reference to day length. (5)

(c) Describe the most widely accepted mechanism of phloem translocation in angiosperms with the help of suitable diagram. (5)

Q5. (a) With the help of a flow chart, give a detailed account of glycolysis. What is the fate of pyruvate in plant respiration? (5)

OR

(a) Discuss the structure and function of reaction center and antenna complex.

(b) Describe properties and mechanism (hypothesis) of action of enzymes. (5)

(c) Discuss essential nutrient elements, criteria of essentiality and role of any two essential elements in plants. (5)

Q6. (a) Write a short note on the following (*any two*): (2.5×2=5)

(i) Bolting

(ii) Apical dominance

(iii) Witches broom

(b) Discuss the mechanism of biological nitrogen fixation and give its significance to plants. (5)

OR

(b) Explain the biogeochemical cycle of Nitrogen.

(c) Describe different methods of studying mineral requirements. Explain how nutrient solution can sustain rapid plant growth? (5)

Q7. (a) Explain with the help of a diagram, the processing of fatty acids in glyoxysomes. How succinate produced in glyoxysomes is processed to form sugars (gluconeogenesis)? (5)

(b) How different amino acids are synthesized in plants by ammonium assimilation and transamination? (NO chemical formula required). (5)

OR

P.T.O.

(b) What is leghaemoglobin? Discuss its role in symbiotic nitrogen fixation.

(c) Discuss the water potential, its components and its significance. (5)

OR

(c) Explain why transpiration is considered as a necessary evil.