Botany (P.G.)

[CBCS]

M.Sc. Third Semester End Examination-2023

(Regular & Supplementary Paper)

PAPER-302

[Plant Physiology, Biochemistry & Molecular Biology]

Full Marks: 40 ***Time: 02 Hrs***

The figures in the right hand margin indicate marks

Candidates are required to give their answers in their own words as far as practicable

Illustrate the answers wherever necessary

Unit – I

[Plant Physiology]

Full Marks 20

Group A

1. Answer any four questions of the following: **4x1= 4**

a. Which pump is activated by light during closure of stomata?

b. What are aquaporins?

c. Write your concept on phloem loading process of photoassimilates.

d. Define glyoxylate cycle.

e. Distinguish between monocarpic and polycarpic senescence in plants.

f. What are light harvesting complexes in photosynthesis?

Group B

2. Answer any two questions of the following: 2x4= 8

a. Describe the Z-scheme of photo synthesis. 4

b. What is mean by T_{50} value of seed germination? Briefly write metabolic changes associated with seed germination. 1+3

c. "All phytohormones are plant growth regulators PGRS but all PGRS are not phytohormones" – Explain. Define in dole and nonindole auxins. 2+2

d) Distinguish between biotic and abiotic stresses with an example of each. What are HSPs? 2+2

Group C

1. Answer any one question of the following: 1x8=8

a) Name the precursor substances for biosynthesis of ethylene and gibberellins. Write down in brief and show with a flow chart the biosynthetic steps of ethylene. What is Yang cycle? 1+5+2

b) Differentiate between phototropism and Photoperiodism? All enzymes of TCA cycle are located in the mitochondrial matrix except one which is located in inner mitochondrial membranes in eukaryotes. Write the name of it. What is chemiosmotic theory? Describe the reaction of glycolysis pathway where substrate level phosphorylation occurs. 2+1+1+4

Unit – II

Full Marks 20

[Biochemistry & Molecular Biology]

Group A

1. Answer any four questions of the following: 4x1= 4

a) What is meant by nucleophilic attack?

b) Write the name of a tropane alkaloid and its source plant.

c) What is NOD factor? State its chemical nature.

d) What is zwitterions.

e) Mention the role of Dopamine.

f) Distinguish between Furan and Pyran.

Group B

2. Answer any two questions of the following: 2x4= 8

a) Write short notes on the synthesis and breakdown of starch. 2+2

b) Draw and describe the basic structure of carotenoid molecule. 2+2

c) Give an overview of phospholipid biosynthesis through a flowchart in plants and its role in a cell. 4

d) How is sulphur reduced in plants before its incorporation into organic molecules?

Group C

3. Answer any one question of the following: 1x8=8

a) Discuss in details the procedure of nodule formation in legumes with suitable diagrams. 6+2

b) Derive Michaelis-Menten equation. Give two examples of coenzymes. 6+2