No. of Printed Pages : 3 **RLSE–106**

Ph. D. IN LIFE SCIENCES (PHDLS)

Term-End Examination

December, 2025

RLSE-106 : BIOCHEMISTRY

Time : 3 Hours *Maximum Marks : 100*

***Note** : (i) Attempt any **five** questions.*

(ii) All questions carry equal marks.

1. (a) Enumerate the different types of Reactive Oxygen Species (ROS) generated in plants.

   (b) Discuss the involvement of chloroplast, mitochondria and proxisomes in the generation of ROS. 10+10=20

2. Differentiate between glycophytes and holophytes with examples. Describe the different responses of plants exposed to high and low temperature stress. 4+16=20

3. Discuss the chemical structure of phytochelatin. Discuss with proper diagrams, how do the phytochelatins regulate heavy metal stress tolerance in plants ? 5+15=20

4. (a) Discuss the different functions of abscisic acid in plants.

   (b) Give a detailed account of biosynthesis and catabolism of abscisic acid.

   10+10=20

5. Why are Late Embryogenesis Abundant (LEA) proteins so called ? Citing suitable examples, discuss the major groups of LEA proteins with reference to their structural characteristics and proposed functions.

   5+15=20

6. (a) Describe different steps of phenylpropanoid pathway and mention its significance is plant biochemistry.

   (b) Enumerate the advantages of secondary metabolite production from cultured cells. 10+10=20

7. Define photorespiration. How does it differ from normal respiration ? Highlight, with schematic diagram, the biochemical pathways C_4 photosynthesis in plants.

2+3+15=20

8. (a) How are the Nod factors produced during symbiotic nitrogen fixation in plants ?

   (b) Highlight the role of nitrogenase enzyme complex in nitrogen assimilation. 10+10=20

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