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RLSE-106

Ph. D. LIFE SCIENCES (PHDLS)

Term-End Examination

June, 2026

RLSE-106 : BIOCHEMISTRY

Time : 3 Hours

Maximum Marks : 100

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

(ii) All questions carry 20 mark each.

1. (a) Discuss the role of osmolytes in overcoming environmental stress in plants.

(b) Explain the role of glutamine synthetase and glutamate synthase in nitrogen assimilation. 10+10

2. (a) Mention the different functions of secondary metabolites in plants.
- (b) Enumerate the advantages and limitations of secondary metabolite production from cultured cells. 5+15
3. (a) Discuss the advantages and disadvantages of phytoremediation.
- (b) What are phytochelatins ? How are they synthesized ? How do they regulate heavy metal stress tolerance in plants ? 10+10
4. (a) Discuss the biosynthetic and catabolic pathways for abscisic acid (ABA) in plants.
- (b) Explain the crosstalk between ABA-dependent and ABA-independent pathway in mediating stress tolerance. 10+10
5. What is Kranz anatomy ? Elaborate the photosynthetic mechanism via CA pathway in plants with the help of a diagram. 5+15

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6. (a) Enumerate the different types of reactive oxygen species (ROS) and their effects.
- (b) How are peroxisomes involved in ROS production ? 15+5
7. Distinguish between the following : 5+10+5
- (a) Halophytes and Glycophytes
- (b) Group I Late embryogenesis abundant (LEA) proteins and Group III LEA proteins.
- (c) C3 plants and C4 plants.

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