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GANDHI INSTITUTE OF ENGINEERING AND TECHNOLOGY, ODISHA, GUNUPUR

(GIET UNIVERSITY)

M. Sc. (First Semester - Regular) Examinations, February – 2025

PP 504 – Physiological and Molecular Responses of Plants to Abiotic Stresses

(Agriculture & Horticulture)

Time: 2 hrs | Maximum: 50 Marks

Answer ALL questions

(The figures in the right hand margin indicate marks)

PART – A **(2 x 5 = 10 Marks)**

Q.1. Answer ***ALL*** the questions	CO #	Blooms Level
a. List the common types of environmental stresses faced by plants.	CO1	L2
b. How do xerophytes differ from hydrophytes?	CO2	L2
c. How do thick cuticles and sunken stomata contribute to drought resistance in plants?	CO2	L4
d. How does membrane lipid unsaturation contribute to cold tolerance in plants?	CO2	L2
e. Discuss the genetic basis of drought tolerance in plants?	CO3	L4

PART – B **(6 x 5 = 30 Marks)**

Answer ***ANY SIX*** questions	CO #	Blooms Level
2. Describe the symptoms of waterlogging observed in plants, including the visible effects on leaves and roots.	CO2	L2
3. Explain how stomatal regulation and leaf morphology changes help plants cope with heat stress.	CO3	L6
4. Define WUE and explain its significance in agriculture.	CO1	L1
5. What is SOS Pathway? How it influences the exclusion of Na^+ ions from plant?	CO2	L2
6. Differentiate between chilling injury and freezing injury in plants.	CO2	L1
7. Why solar radiation is considered a stress for plant? List out its harmful effects.	CO2	L2
8. Explain Soil-Water-Atmosphere Continuum and write its important component.	CO1	L2
9. What is phenology, and why is it important in understanding plant and ecosystem responses to environmental changes?	CO1	L2

PART – C **(10 x 1 = 10 Marks)**

Answer ***ANY ONE*** question	CO #	Blooms Level
10. Explain the effects of drought stress on plants at morphological, physiological, biochemical, and molecular levels.	CO2	L2
11. Explain the various tolerance mechanisms that enable plants to survive and adapt to salt stress.	CO3	L3
12. Discuss the internal and external stress factors contributing to heat stress in plants. Also, justify how plants use to cope with heat stress, including repair mechanisms, and molecular/genetic adaptations?	CO3	L3

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