

B.Sc. BOTANY
FIFTH SEMESTER (SPECIAL REPEAT)
STRESS BIOLOGY
BSB – 503

(Use Separate Answer Scripts for Objective & Descriptive)

Duration : 3 hrs.

Full Marks : 70

Time : 20 min.

(PART-A: Objective)

Marks : 20

Choose the correct answer from the following:

1 × 20 = 20

- Which of the following are more prone to water stress
 - Xerophytes
 - Mesophytes
 - Hydrophytes
 - Both Mesophytes and Xerophytes
- During acclimation tolerance of plants against particular stress is
 - Decreased
 - Not affected
 - Increased
 - All of the above
- Reduced or changed function of the plant in response to stress is called as
 - Physical strain
 - Chemical strain
 - Biological strain
 - All of the above
- Presence of salt glands on leaf surfaces is characteristics of
 - Atriplex spongiosa*
 - Tamarix pentandra*
 - Suaeda fruticosa*
 - None of the above
- Which of them are more susceptible to frost injury
 - Tropical plants
 - Subtropical plants
 - Temperate zone plants
 - All of the above
- During flood
 - Anaerobic respiration increases
 - Nutrient absorption increases
 - Cytokinin level increases
 - Blocking of ethylene biosynthesis
- Swelling of grana, altered structural organization of thylakoids, loss of grana stacking are the response to
 - Heat stress
 - Chilling stress
 - Flood stress
 - All of the above
- Which of the following statement is incorrect
 - ACC synthesis increases in root during flood stress
 - Intercellular freezing occurs when temperature falls suddenly
 - Sorbitol accumulation in cells take place during water stress
 - The plants with free -SH group is more resistant to freezing stress
- Which of the following does not have cryoprotective functions in plant tissue
 - Antifreeze proteins
 - Sugars
 - Saturated fatty acids
 - None of the above

10. Which of the following statement is wrong
- Chilling stress increases cell membrane leakage
 - Unsaturated fatty acid level decrease in cell membrane in chilling stress
 - ABA activity increases in drought
 - Proline concentration increases in water stress
11. ----- refers to heritable modification in structure or function that increases the fitness of the organism in a stressful environment
- Adaptation
 - Acclimation
 - Tolerance
 - Resistance
12. Biotic stress in plants is caused by
- Heat
 - Insect
 - Cold
 - Water
13. Which amino acid chiefly accumulate in cells of water stressed plant.
- Proline
 - Leucine
 - Glycine
 - Methionine
14. Stress condition may be induced by
- Heat
 - Water
 - Cold
 - All of these
15. Which hormone is involved in the formation of adventitious roots , induced by flooding
- Gibberellin
 - Ethylene
 - ABA
 - Cytokinin
16. . Formation of aerenchyma in plants induced by which stress
- Water
 - Flood
 - Heat
 - Cold
17. What is ROI
- Relative Oxygen Index
 - Reactive Oxygen Index
 - Relation Oxygen Index
 - None of these
18. Select the enzyme which dismutated hydrogen peroxide
- Ascobate peroxidase
 - Ascobate reductase
 - Super oxide dismutase
 - All of these
19. Which hormone is responsible for intermodal elongation of deep water rice
- Auxin
 - Gibberellin
 - Ethylene
 - ABA
20. Identify the resurrection plants
- Bryophyte
 - Algae
 - Lichens
 - All of these

(PART-B : Descriptive)

Time : 2 hrs. 40 min.

Marks : 50

[Answer question no.1 & any four (4) from the rest]

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|---|--------|
| 1. Discuss about the adaptation strategies of the plants taken in response of chilling and freezing stress. | 5+5=10 |
| 2. What is stress? Discuss about the physiological effect of water stress in plants. | 2+8=10 |
| 3. Write short notes on:
a. Salt tolerance in plants
b. Pathogenesis related (PR) proteins | 5+5=10 |
| 4. Write short notes on:
a. Hypersensitive reaction in biotic stress
b. Role of Jasmonates on biotic stress | 5+5=10 |
| 5. Describe heat stress. What are the physiological effects of heat stress? | 10 |
| 6. Explain:
a. Biochemical changes induced by flooding
b. Hypertrophy | 5+5=10 |
| 7. Explain how accumulation of osmolytes helps in water stress. | 10 |
| 8. Describe the oxy free radical induced damage. | 10 |

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