

## **Stress Biology and Genomics (MMBB0517)**

### **Long Questions**

1. What are the different kinds of abiotic stresses that can affect plant productivity? Give a brief description on their tolerance mechanisms in plants.
2. How does drought stress affect plant growth and development? Detail any one abiotic stress signaling in plants.
3. What are the components of drought resistance in plants? Describe in brief the major pathways linked to drought tolerance in plants.
4. Explain the physiological, biochemical, and molecular basis of tolerance mechanisms in drought-stressed plants.
5. What are the resistance mechanisms employed by plants against insect pests and pathogens?
6. Discuss the strategies used to manipulate drought tolerance in plants, such as osmotic adjustment and osmoprotectant synthesis.
7. What is the role of reactive oxygen species (ROS) and antioxidants in plant responses to stress? Give a detailed note on the ROS production and scavenging pathways in plants.
8. Describe the signaling components involved in ABA (abscisic acid) signaling and their role in stress response.
9. How does water logging stress affect plant growth and metabolism? Write the biotechnological interventions to tolerate water-logging stress in plants.
10. Explain the hormonal regulation and flooding tolerance mechanisms in plants experiencing water logging stress.
11. What are the effects of salinity stress on plant physiology and metabolism? Describe role of ABA in salinity stress response in plants.
12. Describe the SOS pathways and ion homeostasis mechanisms involved in improving salinity tolerance in plants.
13. Discuss the physiological and biochemical changes associated with high and low temperature tolerance mechanisms in plants.
14. How do high and low light stresses affect plant morphology and physiology, including issues like photooxidation and plastid development?
15. What is RNAi? Write the mechanism and application in biotic stress tolerance in plants.