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GANDHI INSTITUTE OF ENGINEERING AND TECHNOLOGY UNIVERSITY, ODISHA, GUNUPUR
(GIET UNIVERSITY)

M. Sc. (Third Semester) Regular Examinations, December– 2024

22PSPE302– Plant Physiology

(M.Sc.- Plant Science)

Time: 3 hrs | Maximum: 60 Marks

(The figures in the right hand margin indicate marks.)

PART – A **(2 x 10 = 20 Marks)**

Q.1. Answer ***ALL*** questions	CO #	Blooms Level
a. What is osmosis, and how does it contribute to water absorption in plants?	CO1	K2
b. Describe the significance of the root hair zone in water absorption?	CO1	K1
c. What is plant physiology, and why is it important in the field of biology?	CO1	K2
d. What are the major functions of nitrogen (N) in plant physiology?	CO2	K1
e. Explain how potassium (K) deficiency in plants can affect their health.	CO2	K1
f. Differentiate between aerobic and anaerobic respiration.	CO2	K1
g. What is the overall chemical equation for aerobic respiration?	CO3	K1
h. Explain the concept of the respiratory quotient (RQ) and its significance.	CO3	K2
i. What is the primary function of chloroplasts in photosynthesis?	CO4	K1
j. How does ethylene influence the ripening of fruits?	CO4	K1

PART – B **(10 x 5 = 50 Marks)**

Answer ***ANY FIVE*** questions	Marks	CO #	Blooms Level
2. a. Discuss the significance of the transpiration-cohesion-tension (TCT) mechanism in water transport within plants.	5	CO1	K1
b. Compare and contrast the mechanisms of water uptake in root cells during active transport and osmosis.	5	CO1	K1
3.a. Explain the role of plant hormones in regulating plant growth and development, providing examples of specific hormones and their functions.	5	CO1	K2
b. Detail the principles of water absorption in plants, including osmosis, root pressure, and the role of soil-root interfaces.	5	CO1	K1
4. a. How do mycorrhizal associations enhance nutrient uptake in plants, and why are they important for plant nutrition?	5	CO2	2
b. Explain the role of soil pH in nutrient availability and its influence on plant health.	5	CO2	K1
5.a. Discuss the methods and strategies for preventing and correcting nutrient imbalances in plants.	5	CO2	K1
b. Describe the concepts of nutrient recycling and nutrient solutions in hydroponic systems, highlighting their environmental and practical benefits.	5	CO2	K2
6. a. Explain the significance of the respiratory quotient (RQ) and how it can be used to infer the types of substrates being metabolized in respiration?	5	CO3	K2
b. Discuss the alternative pathways to the electron transport chain (ETC), such as glycolysis and lactate fermentation, and their significance in different	5	CO3	K1

	situations?			
7.a.	How do organisms exhibiting cyanide-resistant respiration adapt to continue respiration in the presence of cyanide, and what are some examples of such organisms?	5	CO3	K2
b.	Describe the stages of seed germination and the factors influencing the process?	5	CO4	K1
8. a.	Discuss the key events and hormonal regulation involved in the process of flowering?	5	CO4	K1
b.	Compare and contrast the effects of auxins and gibberellins on plant growth, highlighting their specific mechanisms of action?	5	CO4	K2