QP Code: RD22MSC137 | Reg. No | | | | | | | | | | | AY 22

GIET UNIVERSITY, GUNUPUR – 765022

M. Sc. (Third Semester) Regular Examinations, December – 2023

22PSPE302 – Plant Physiology

(Life Sciences)

Time: 3 hrs | Maximum: 70 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. Describe the significance of the root hair zone in water absorption.	CO1	K1
b. How does the study of plant physiology contribute to sustainable agriculture?	CO1	K1
c. What is osmosis, and how does it contribute to water absorption in plants?	CO1	K2
d. Explain how potassium (K) deficiency in plants can affect their health?	CO2	K1
e. What is the role of iron (Fe) in plant nutrition, and how does soil pH influence its uptake?	CO2	K2
f. Differentiate between aerobic and anaerobic respiration.	CO2	K1
g. What is the overall chemical equation for aerobic respiration?	CO3	K1
h. How do different substrates, such as carbohydrates, fats, and proteins, affect the respiratory quotient (RQ)?	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. How do mycorrhizal symbiosis and the presence of root hairs contribute to efficient water absorption in plants?	5	CO1	K1
b. Explain the concept of the transpiration ratio (water use efficiency) and its ecological and agricultural implications	5	CO1	K2
3.a. Describe the historical developments in plant physiology, highlighting key discoveries and their impact on our understanding of plant processes.	5	CO1	K2
b. Explain the role of plant hormones in regulating plant growth and development, providing examples of specific hormones and their functions.	5	CO1	K2
4. a. Describe the concepts of nutrient recycling and nutrient solutions in hydroponic systems, highlighting their environmental and practical benefits.	5	CO2	K2

b.	Summarize the key principles and mechanisms involved in the absorption of elements in plants and their significance in plant growth and development	5	CO2	K1
5.a.	Discuss the factors that can influence nutrient availability in the soil and how they impact plant nutrient uptake.	5	CO2	K1
b.	Outline the principles of plant nutrition, including nutrient absorption, deficiency symptoms, and the importance of nutrient ratios in plant growth.	5	CO2	K2
6. a.	Discuss the alternative pathways to the electron transport chain (ETC), such as glycolysis and lactate fermentation, and their significance in different situations?	5	CO3	K2
b.	Describe the stages of aerobic respiration, including glycolysis, the citric acid cycle, and the electron transport chain. Highlight their roles in ATP production.	5	CO3	K2
7.a.	What are some ecological and physiological implications of cyanide-resistant respiration, and where is it observed in nature?	5	CO3	K1
b.	Compare and contrast the effects of auxins and gibberellins on plant growth, highlighting their specific mechanisms of action?	5	CO4	K2
8. a.	How do environmental factors such as photoperiod and temperature influence flowering in plants?	5	CO4	K2
b.	Discuss the key events and hormonal regulation involved in the process of flowering?	5	CO4	K1