Reg. No. | | | | | | | | |

G. VENKATASWAMY NAIDU COLLEGE (AUTONOMOUS), KOVILPATTI – 628 502.

PG DEGREE END SEMESTER EXAMINATIONS - APRIL 2025.
(For those admitted in June 2023 and later)

PROGRAMME AND BRANCH: M.Sc., BOTANY

SEM	CATEGORY	COMPONENT	COURSE CODE	COURSE TITLE
IV	PART-III	CORE-13	P23BO413	PLANT PHYSIOLOGY AND PLANT METABOLISM

Date & Session:24.04.2025/FN **Time: 3 hours** **Maximum: 75 Marks**

Course Outcome	Bloom's K-level	Q. No.	**SECTION – A (10 X 1 = 10 Marks)** **Answer ALL Questions.**
CO1	K1	1.	What will happen if a plant cell is placed in a hypertonic solution? a) Osmosis b) Diffusion c) Plasmolysis d) Reverse osmosis
CO1	K2	2.	Yellowing of plant leaves due to nitrogen deficiency is called? a) Necrosis b) Chlorosis c) Wilting d) Scorching
CO2	K3	3.	Choose the first stable product in the C4 pathway. a) Gylceraldehyde-3-phophate b) Malate c) Oxaloacetate d) 3-Phosphoglycerate
CO2	K4	4.	Defend the important role of Photosystem II in Photosynthesis? a) Synthesis of ATP b) Photolysis of water and oxygen evolution c) NADPH production d) Carbon fixation
CO3	K3	5.	Identify the type of nitrogen fixation that involves the bacteria, Rhizobium? a) Non-symbiotic nitrogen fixation b) Symbiotic nitrogen fixation c) Chemical nitrogen fixation d) Aerobic nitrogen fixation
CO3	K6	6.	Imagine a person consumes Cyanide, what will be its effect in the process of respiration? a) Stimulates ATP production b) Blocks the electron transport chain c) Enhances glycolysis d) Inhibits the TCA cycle directly
CO4	K5	7.	Judge the truth related to Stress hormone from the pool of information given below a) Auxin creates oxidative stress b) Abscisic acid induces cell withering and cell death c) Cytokinin affects cytological content d) Ethylene kills fruit cells
CO4	K4	8.	Inspect the following processes and identify the one which is regulated by photoperiodism? a) Seed germination b) Flowering c) Water absorption d) Stomatal closure
CO5	K1	9.	Identify the one from the following process that involves the shedding of leaves? a) Abscission b) Transpiration c) Senescence d) Photoperiodism
CO5	K2	10.	What is the significance of stress-responsive proteins in plants? a) They promote growth under stress conditions b) They regulate stress signalling pathways c) They prevent oxidative damage d) Both b and c
Course Outcome	**Bloom's K-level**	**Q. No.**	**SECTION – B (5 X 5 = 25 Marks)** **Answer ALL Questions choosing either (a) or (b)**

CO1	K1	11a.	Briefly explain about the structure of Stomata and its Physiological importance. **(OR)**
CO1	K2	11b.	Write the differences between passive and active absorption of solutes in plants.
CO2	K1	12a.	What are photoreceptors? How do they contribute to photosynthesis? **(OR)**
CO2	K2	12b.	Explain the role of RUBISCO in carbon fixation. Why is it considered inefficient under certain conditions?
CO3	K2	13a.	Describe the chemiosmotic theory of ATP synthesis. What is the role of proton gradient? **(OR)**
CO3	K3	13b.	Briefly explain how the TCA cycle connects with other metabolic pathways in plants.
CO4	K3	14a.	Give explanation on the physiological effects and agricultural applications of gibberellins. **(OR)**
CO4	K1	14b.	Define vernalization. Explain its mechanism and practical applications.
CO5	K4	15a.	Explain the role of ethylene in fruit ripening and its physiochemical mechanisms. **(OR)**
CO5	K4	15b.	How do plants survive under water and salinity stress? Provide examples.

Course Outcome	**Bloom's K-level**	**Q. No**	**SECTION – C (5 X 8 = 40 Marks)** **Answer ALL Questions choosing either (a) or (b)**
CO1	K4	16a.	Explain how mineral deficiencies lead to specific plant disorders. Use examples to explain how morphological symptoms can help identify the deficient nutrient? **(OR)**
CO1	K4	16b.	Analyse the source-sink relationship in the translocation. What are the factors that determine the efficiency of phloem loading and unloading?
CO2	K5	17a.	Defend about the importance of light harvesting complexes in photosynthesis. How do they enhance light capture and energy transfer? **(OR)**
CO2	K5	17b.	Evaluate the differences between ATP and NADPH production in cyclic and non-cyclic photophosphorylation.
CO3	K5	18a.	Evaluate the role of symbiotic and non-symbiotic nitrogen fixation in different ecosystems. **(OR)**
CO3	K4	18b.	Write detail about glycolysis. Discuss the regulatory mechanisms of key enzymes.
CO4	K5	19a.	Assess the importance of brassinosteroids in stress responses and growth regulation in plants. How can they be used in agriculture? **(OR)**
CO4	K5	19b.	What are the physiological and biochemical effects of seed dormancy. Explain its role in plant survival.
CO5	K6	20a.	Develop a model that explain plants adaption mechanisms to environmental stresses. And analyse the mechanism that is most critical under extreme condition? **(OR)**
CO5	K6	20b.	Design a sustainable agricultural approach to minimizes the senescence effects in crops while optimizing yield and quality.