

II AND IV SEMESTER-LESSON PLAN -CBCS (2021-22)

PLANT PHYSIOLOGY AND EVOLUTION

PROGRAMME: B.Sc.

NAME OF THE TEACHER -M.M. SWAMY

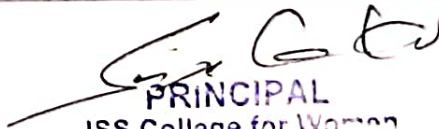
DEPARTMENT OF BOTANY

SL No	MONTH	CONTENTS	NO OF HOURS
01	MAY (THEORY) (IVSEMESTER)	Plant physiology: Plant and water Relations -Diffusion, Imbibition, Osmosis, Cell as osmotic system, Plasmolysis, Active and passive absorption of water (apoplast and symplast) Photosynthesis: Introduction, Photosynthetic apparatus, visible, active and absorptive spectra. Mechanism-Light reaction Nitrogen metabolism: Nitrogen fixation-abiotic and biotic(symbiotic and non-symbiotic). Mechanism-biological nitrogen fixation, nitrogen cycle, nitrate reduction. Evolution: Origin of life - Chemical evolution theory, Stanley Miller experiment.Theories of organic Evolution-Lamarckism.	04X04=16
	PRACTICALS (IVSEMESTER)	Major experiments: Determination of Osmotic potential by plasmolytic method.Experiment on the relationship between transpiration and absorption.Experiment on Oxygen evolution during photosynthesis:1) effect of light intensity, 2)Quality of light.	3X5=15 15X4=60
02	JUNE (THEORY) (IVSEMESTER)	Absorption of Minerals -Passive absorption: Mass flow, ion exchange, Donnan's equilibrium. Active absorption: carrier concept, cytochrome pump theory protein-lecithin theory. Dark Reaction-Calvin cycle, Hatch-Slack pathway and CAM. Photorespiration. Factors affecting photosynthesis-a brief account of Blackmann's law of limiting factors. Amino acids-transamination and reductive amination. Growth: Definition, phases of growth, sigmoid curve. Phytohormones: Chemical nature and Role of plant hormones (Auxin, Gibberellins, Cytokinins, Ethylene and ABA) in the field of agriculture, horticulture and tissue culture. Weismannism, Darwinism, HugoDevries theory, Neo Darwinism.	04X04=16 3X5=15

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	PRACTICALS (IV SEMESTER)	Separation of pigments by paper chromatography. Demonstration of starch in leaf. Suction force due to transpiration. Determination of stomatal index, stomatal frequency. Effect of temperature on permeability of cell membrane	15X4=60
03	JULY (IV SEMESTER) (THEORY)	Ascent of sap- Vital theories, Root pressure theory and physical force theories. Translocation of Solutes- Path of translocation and mechanism of phloem transport: Munch's hypothesis. Enzymes: General characters, classification, properties and mode of action-Lock and Key theory, Induced fit theory. Respiration: Introduction, types. Structure of mitochondria. Aerobic respiration – Mechanism, Glycolysis, Krebs cycle. Plant movements: Tropisms: Photo, Hydro, Geo and Thigmotropism. General account of photoperiodism and vernalization. Transpiration: Definition, Types, mechanism of stomatal transpiration: Starch-sugar inter conversion theory, Potassium ion exchange theory, action of potassium transport, antitranspirants, significance of transpiration and guttation.	04X04=16
	PRACTICALS (IV SEMESTER)	Streaming of cytoplasm, Determination of transpiration by Ganong's Potometer. Experiment to demonstrate fermentation (Kunhe's fermentation vessel). Measurement of growth by Arc Auxonometer. Experiment to demonstrate Geotropism, phototropism and hydrotropism. Root pressure experiment, Ganong's respirometer experiment. Determination of unequal transpiration by using cobalt chloride paper.	3X5=15 15X4=60
04	AUGUST (IV SEMESTER) (THEORY)	Mineral nutrition: Role of mineral nutrients in physiological processes. Essential nutrients: Macronutrients-N, P, K (Primary nutrients) and Ca, Mg, S (Secondary nutrients) Micronutrients: Zn, Fe, Mo, Mn, Cu and B. A brief account of hydroponics. Terminal oxidation, ATP Synthesis, Chemiosmotic theory. Anaerobic respiration- alcoholic and lactic acid fermentation. Respiratory quotient. Factors affecting respiration.	04X04=16
	PRACTICALS (IV SEMESTER)	Determination of unequal transpiration by using cobalt chloride paper, Effect of auxins on rooting, Respiration of roots, Quantitative test for carbohydrates, proteins and fats, Seed viability test: Tetrazolium test and Paper Towel method, Photographs: Mineral nutrition deficiency symptoms, Photoperiodism, Light spectrum. Instruments: Spectrophotometer, Centrifuge, Calorimeter, Photographs and charts – From Evolution	3X5=15 15X4=60

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