

B.Sc. Botany, Sixth Semester

Code: BOT-602

Contact Hours: 50 Hours

Credit Points:

Univ Code:

Workload: 3 hours per week

Evaluation: Continuous Internal Assessment - 30 marks

Semester and Examination- 70 marks

Paper-6.2: Plant Physiology

Unit 1. Plant water relations:

Significance of water for plants. Solutions, Colloidal systems Osmosis (OP, TP, DPD and water potential, Plasmolysis, exosmosis, deplasmolysis and endosmosis). **03Hrs**

Unit 2. Absorption of water: Mechanism of active osmotic and active non-osmotic and passive absorption. **03Hrs**

Unit 3. Ascent of sap, path of ascent of saps (only *Balsam* plant Expt.) Mechanism, Root pressure theory, Dixon's and Jolly's theory of cohesion. **03Hrs**

Unit 4. Absorption of Mineral salts: Mechanism of absorption – Passive absorption (Diffusion, Mass flow, Ion exchange, Donnan's Equilibrium), Active absorption (Lundergardh and Burstrom Cytochrome Pump theory, Lecithin Cycle, Carrier concept). **03Hrs**

Unit 5. Transpiration: Types of transpiration, Mechanism of stomatal transpiration-structure of stomata, Mechanism of stomatal movements, Starch Sugar theory and Proton transport concept. Significance of transpiration, Factors affecting transpiration. Guttation and wilting point. **04Hrs**

Unit 6. Translocation of solutes: - Types (Upward, radial and downward), path (phloem Ringing Expt ., Protoplasmic streaming theory and Munch Flow theory). **03Hrs**

Unit 7. Enzymes: Nomenclature, Structure, Classification and Mode of enzyme action. **02Hrs**

Unit 8. Photosynthesis: Structure and functions of chloroplast, Photosynthetic pigments, Photosystem I and Photosystem II. The Z scheme – the light and dark reactions, C₃, C₄ pathway and CAM plants. The law of limiting factors, Factors affecting photosynthesis. Photosynthesis in Bacteria. **05 Hrs**

Unit 09. Respiration: Introduction, Types, biochemical pathways of respiration- Glycolysis. TCA Cycle, Electron Transport System and Terminal oxidation. An account of anaerobic respiration and fermentation. Significance as an industrial process. **05 Hrs**

Unit 10. Plant Growth Regulators: Definition, types of growth regulators, Physiological and Practical application of Auxins (IAA), Gibberellins (GA₃), Cytokinins, Ethylene and Abscissic acid (ABA). Physiology of Flowering: Photoperiodism, types, role of phytochrome, vernalization, seed dormancy. **05Hrs**

Unit 11. Plant Movement: Introduction, Classification, tropic movements (Hydro, Geo, Phototropic) and Sismonastic. **04Hrs**

**B.Sc. Botany, Sixth Semester, Plant Physiology
Practical Question Paper – 6.2**

Time: 03 Hrs

Max Marks: 40

1. Perform the Physiology expt. 'A' and show to examiner (Major Expt.).	10
2. Perform the physiology expt. 'B' and show to examiner (Minor Expt).	07
3. Conduct a micro chemical test in specimen 'C' and identify the cell Inclusions	03
4. Identify and comment on the physiological expt. D , E , F, G & H	15
5. Submission of Records	05
Total	40

**B.Sc. Botany, Sixth Semester Scheme of Evaluation
Paper-6.2: Plant Physiology**

1. Physiology (A)	- Principle, Procedure	05
	- Setting of Expt.	05
2. Physiology (B)	- Principle, Procedure	04
	- Setting of Expt.	03
3. Cellulose, Lignin, Starch, Protein, Cystoliths and Raphides		03
4. Aim of the expt., Principle D, E, F, G and H		15
5. Submission of Records		05
Total		40

Reference Books :-

- Dennis, D.T., Turpin, D.H. Lefebvre, D.D. and Layzell (eds). 1997. Plant Metabolism (2nd edition). Longman, Essex, England.
- Galston, A.W. 1989. Life Processes in Plants. Scientific American Library, Springer-Verland, New York.
- Hopkins, W.G. 1995. Introduction to Plant Physiology. John Wiley & Sons., Inc., New York.
- Lea, P.J. and Leegod, R.C. 1999. Plant Biochemistry and Molecular Biology. John Wiley Sons, Chinchester, England.
- Mohr, H. and Schopfer, P. 1995. Plant Physiology. Springer-Verland, Berlin.
- Salisbury, F.B. and Ross, C.W. 1992. Plant Physiology (4th edition). Wadsworth Publishing Co., California.
- Taiz, L. and Zeiger, E. 2002. Plant Physiology (3rd edition). Sinauer Associates, Inc., Punishers, Massachusetts, USA.
- P.K.Gupta , Elements of Biotechnology , Rastogi Publications , Meerut.
- V.K.Jain , Fundamental of Plant Physiology , S. Chand & Co. New- Delhi.
- P.S.Gill , Plant Physiology , S. Chnad & Co. New Delhi.
- H. Srivastava, Plant Physiology , S. Chnad & Co., New Delhi.