B.Sc. Part-II
BOTANY

Scheme:

Min. Pass Marks: 36		**Max Mark: 100**
Paper - I	3 Hrs duration	Max. Marks 33
Paper - II	3 Hrs duration	Max. Marks 33
Paper - III	3 Hrs duration	Max. Marks 34
Practicals Min. Marks : 18	4 Hrs duration	Max. Marks 50
Duration of examination of each theory paper		3 hours
Duration of examination of practicals		4 hours

Note:

1. There will be 5 questions in each paper . All questions are compulsory. Candidate has to answer all questions in the main answer book only
2. Q.No. I will have 20 very short answer type Questions (not more than 20 words) of half marks each covering entire syllabus.
3. Each paper is divided into four units. There will be one question from each unit. These Q.No. 2 to 5 will have internal choice.

B.Sc. PART-II

Paper I : Molecular Biology and Biotechnology

UNIT-1

Genetic Material: Biological, chemical and physical nature of hereditary material, structure of DNA and RNAs (mRNA, tRNA and rRNA). Watson and crick model of DNA, Nucleosome model.

DNA replication: Meselson- stahl experiment of semiconservative replication of DNA.

UNIT-2

Central dogma of life, Transcription in eukaryotes: role of promoter, gene, pre mRNA synthesis, pre mRNA processing: capping, splicing and polyadenylation.

Translation: genetic code (Codon), initiation, elongation and termination.

UNIT-3

Biotechnology: Functional definition. Basic aspects of plant tissue culture, basal medium, media preparation and aseptic culture technique. Concept of cellular totipotency; Callusing; Differentiation and Morphogenesis; Micropropagation; Tissue culture and its applications. Basic concept of Protoplast culture, Anther culture, Embryo culture nad their applications.

UNIT- 4

Recombinant DNA Technology: Tools and Techniques used in rDNA technology. Restriction enzymes. Vectors for gene transfer, Bacteriophage, plasmids, cosmids and Artificial chromosome, cDNA technology, gene amplification.

B.Sc. Part II

Paper- II (Pass Course Syllabus)

Plant Physiology and Biochemistry

(2 Hrs/week) Max. Marks 33; Duration of examination of theory paper: 3hours

Unit-1

Water : Absorption and transport of water; Ascent of sap. Transpiration, stomatal factors affecting transpiration. Guttation.

Mineral Nutrition : Essential micro and macro nutrients; their uptake, hydroponics-and nutrient requirement deficiency and toxicity symptoms.

Unit- 2

Photosynthesis : Pigments, Photosynthetic apparatus, Light reaction, photo system I & II, Z scheme, photophosphorylation, C3 (Calvin cycle), C4 Cycle, and factors affecting the photosynthesis.

Respiration : Aerobic and anaerobic respiration; RQ (Respiratory Quotient), Kreb's cycle, electron transport system, oxidative phosphorylation and factors affecting the process, Fermentation.

Unit-3

Carbohydrates: Introduction, importance, nomenclature, classification, molecular structure & function of mono, di and polysaccharides, their properties, glycosidic linkages and glycoprotein.

Proteins: Amino acids-structure, electrochemical properties, peptide bonds, chemical bonds and nomenclare, structure and classification of proteins, physical and chemical properties.

Enzymes: Structure, nomenclature & classification of enzyme. Characteristics of enzymes. mechanism of action, multi-enzyme system, regulation of enzyme activity.

Unit- 4

Photoperiodism & vernalisation: Physiology and mechanism of action, concept of florigen and phytochrome.

Plant Hormones: Auxins, Gibberellins, Cytokinins, Ethylene and ABA: discovery & Physiological effects.

Exercises:

1. To determine the osmotic potential of vacuolar sap by plasmolytic method.
2. To study the permeability of plasma membrane using different concentrations of organic solvents.
3. To study the effect of temperature of permeability of plasma membrane.
4. To Separate chloroplast pigments by solvent method.
5. To Separate chloroplast pigments using paper chromatography.
6. To separate amino acids in a mixture by paper chromatography.
7. To prepare the standard curve of protein.
8. To demonstrate the tests for proteins in the unknown samples.
9. To demonstrate the enzyme activity Catalase, peroxidase and amylase.
10. To demonstrate the tests for different types of carbohydrates and lipids.
11. Bioassay of growth hormone tauxin, cytokinin, gibberellins.
12. Demonstration of phenomenon of osmosis by use of potato osmometer
13. To demonstrate root pressure.
14. To demonstrate rate of transpiration by use of photometers.
15. Photosynthesis by inverted funnel method. Moll's experiment.
16. To demonstration anaerobic and aerobic respiration.
17. R.Q.by Ganong's respirometer.
18. Measurement of growth using auxanometer.

B.Sc. Part II

Paper- III : Pteridophytes, Gymnosperms And Palaeobotany

Exam Duration : 3 Hrs. Maximum Marks : 34

Unit-I

General characters of pteridophytes. Distribution and alternation of generation. Stelar system in pteridophytes. Apogamy and Apospory. Economic importance of pteridophytes.

Unit-II

Morphology, anatomy and reproduction of psilotum, Selaginella, Equisetum and Marsilea. Characteristics of Gymnosperms, distribution (K.R.Sporne)

Unit-III

Morphology, anatomy, reproduction and life cycle of Cycas, Pinus and Ephedra.

Unit-IV

Process of fossilization, types of fossils, techniques of study of fossils. Geological time scale. Primitive land plant: Rhynia, Fossil pteridophytes.

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