B. Sc. III 2nd year. (Botany)

B.SC.-III (BOTANY) PAPER –I

(ANALYTICAL TECHNOLOGY PLANT PATHOLOGY, EXPERIMENTAL EMBRYOLOGY, ELEMENTARY BIOSTATISTICS, ENVIRONMENTAL POLLUTION AND CONSERVATION)

UNIT-I

Structure, Principle and applications of analytical instrumentation.

Chromatography technique, Oven, Incubator, Autoclave, Centrifuge, Spectrophotometere

UNIT-II

Plant Tissue culture techniques, growth media, totipotency, protoplast culture, somatic hybrids and cybrids, micropropagation , somaclonal variations, haploid culture.

Analytical techniques: Microscopy-Light microscope, Electron microscope

UNIT-III

General principles of plant pathology, general symptoms of fungal, bacterial and viral diseases. mode of infection, diseases resistance and control measures, plant quarantine. A study of epidemiology and etiology of following plant diseases.

Rust diseases of wheat, Tikka diseases of groung nut, Red rot of sugar can, Bacterial blight of rice, Yellow vein mosaic of b.hindi, Little leaf of brinjal.

UNIT-IV

Introduction to pollution, green house gases, Ozone depletion, Dissolve oxygen, B.O.D., C.O.D.

Bio magnification, Eutrophication, Acid precipitation, Phytoremediation, Plant indicators., Biogeographical Zones of India, Concept of biodiversity, CBD, MAB, National parks and

biodiversity Hot spots. Conservation strategies. Red Data Book. IUCN threat categories. invasive species. endemic species. concept of sustainable development.

UNIT-V

ELEMENTARY BIOSTATISTICS:

Introduction and application of Biostatics, measure of central tendency-Mean. Median. Mode. measures of dispersal-Standard deviation. standard error.

Books Recommended:

Singh, RS. ***Plant Diseases,*** Oxford & IBH. New Delhi.

Pandey. BP. ***Plant Pathology,*** S.Chand Publishing. New Delhi

Sharma. PD. ***Microbiology and Plant pathology.*** Rastogi Publications, Meerut

Sharma PD. ***Mycology and Phytopathology.*** Rastogi Publications. Meerut

Singh JS. Singh SP and Gupta, SR. ***Ecology Environmental Science and Conservation,*** S. Chand Publishing. New Delhi

Sharma. PD. ***Ecology and Environment,*** Rastogi Publiications. Meerut

Bhojwani. SS and Razdan. MK. ***Plant Tissue Culture:Theory and Practices,*** Elsevier

Sharma AK. ***Text book of Biostatistics,*** Discovery Publishing House Pvt. Ltd.

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(Mrs. Senchal Moghe)

(Mr. Shivakant Mishra)

(Mr Sudheer Tiwari)

B.Sc.-III (BOTANY) PAPER –II
(GENETICS, MOLECULAR BIOLOGY, BIOTECHNOLOGY AND BIOCHEMISTRY)

UNIT-I

Cell and cell organelles, organization and morphology of chromosomes, giant chromosomes, cell division, Mendel's laws, gene interactions, linkage and crossing over, chromosomal aberration, polyploidy, sex linked inheritance, sex determination, cytoplasmic inheritance, gene concept: cistron, muton, recon.

UNIT-II

Nucleic acids, structure and forms of DNA and RNA, DNA/RNA as genetic material, replication of DNA, biochemical and molecular basis of mutation, genetic code and its properties, mechanism of transcription and translation in prokaryotes, regulation of gene expression, Operon model.

UNIT-III

Recombinant DNA, Enzymes in recombinant DNA technology, cloning vectors (Plasmid, Bacteriophages, Cosmids, Phagemids), gene cloning, PCR, Application of Biotechnology; G.M.Plants, Monoclonal antibodies, DNA finger printing

UNIT-IV

Protein: Chemical composition, primary, secondary and tertiary structure of Proteins.

Carbohydrate: general account of monosaccharides, disaccharids and Polysaccharides

Fat: Structure and properties of fats and fatty acids, synthesis and breakdown.

UNIT-V

ENZYMES: Nomenclature and classifaction, components of enzyme, theories of enzyme action, enzyme kinetics (Michaelis-Menten constant), allosteric enzymes, isozymes, Abzymes, Ribozymes, factors affecting enzyme activity.

Books Recommended:

Nelson, DL, Cox, MM, Lehninger *Principles of Biochemistry*, W.H. freeman and Company. New York, USA.

Cooper, GM, *The Cell: A Molecular Approach*, ASM Press & Sunderland, Washington, D.C. Sinauer Associates, MA.

Singh BD, *Fundamental of Genetics*, Kalyani Publication

Singh BD, *Genetics*, Kalyani Publication

Gupta, PK, *Cell and Molecular Biology*, Rastogi Publications, Meerut

Singh, BD, *Biotechnology: Expanding Horizons*, Kalyani publications

Gupta, PK, *Elements of Plant Biotechnology*, Rastogi Publications, Meerut

Gupta, SN, *Concepts of Biochemistry*, Rastogi Publications, Meeru

Jain, JL, Jain S, Jain, N, *Fundamentals of Biochemistry*, S Chand Publishing, New Delhi

B.Sc.-III (Botany)

Practical

1. Study of host parasite relationship pf plant diseases listed above.
2. Demonstration of preparation of Czapek's Dox medium and Potato dextrose agar medium, sterilization of culture medium and pouring.
3. Inoculation in culture tubes and petriplates.
4. Gram Staining.
5. Microscopic examination of Curd.
6. Study of plant diseases as listed in the theory paper.
7. Biochemical test of carbohydrate and protein.
8. Instrumentation techniques

TIME: 4 Hrs. **PRACTICAL SCHEME**

		M.M. : 50
1.	Plant Disease/Symptoms	10
2.	Instrumentation techniques	05
3.	Staining of Microbes	05
4.	Tissue Culture techniques	05
5.	Spotting	10
6.	Project Work/ Field Study	05
5.	Viva-Voce	05
6.	Sessional	05

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