

# Singhania University

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## **M.PHIL. - BOTANY**

Scheme of Examination

S.No.	Paper Code	Name of Paper	Max. Marks	Duration
1.	M.PhilBOT. 111	Biostatistics	100	3 Hrs.
2.	M.PhilBOT. 112	Modern Molecular Biology	100	3 Hrs.
3.	M.PhilBOT. 113	Plant Physiology	100	3 Hrs.
4.	M.PhilBOT. 114	Dissertation	100	
Total			400	

Paper - I

Biostatistics (M.PhilBOT. 111)

Maximum Marks: 100 Times Allowed: 3 Hrs.

Unit - I

Research – Definition, Importance and Meaning of Research, Characteristics of Research, Types of Research, Steps in Research, Identification, Selection and Formulation of Research Problem, Research Questions, Research Design, Formulation of Hypothesis, Review of Literature.

#### Unit – II

Sampling Techniques: Sampling theory, Types of Sampling, Steps in Sampling, Sampling and Nonsampling error, Sample Size, Advantages and limitations of Sampling.

Collection of Data: Primary Data, Meaning, Data Collection Methods, Secondary Data, Meaning, Relevance's, Limitations and Cautions.

#### Unit – III

Statistics in Research – Measure of Central Tendency, Dispersion, Skewness and Kurtosis in Research.

Hypothesis – Fundamentals of Hypothesis Testing, Standard Error, Point and Interval Estimates,

Important NonParametric Tests: Sign, Run, Kruskal, Wallis tests and MannWhitney Test.

#### Unit – IV

Parametric Tests: Testing of significance Mean, Proportion, Variance and Correlation, Testing for Significance of Difference between Means, Proportions, Variances and Correlation Co efficient. Chisquare tests, ANOVA One way and two ways.

Research Report: Types of Reports, Styles of reporting, Steps in drafting reports, Editing the final draft, Evaluating the final draft.

Ref. books:

- 1 Statistical Methods by S.P. Gupta.
- 2 Research Methodology, Method and Techniques by C.R. Kothari or by Santosh Gupta.

## Paper – II

### Modern Molecular Biology (M.PhilBOT. 112)

Maximum Marks: 100 Times Allowed: 3 Hrs.

#### Unit – I

Genome Organization in prokaryotes: Viral genome, bacterial genomes, genome size, content and complexity, clusters and repeats, overlapping genes, pseudogenes. Genome organization in eukaryotes: Eukaryotic genomes, chromosome structure and DNA

sequence organization, organization of genes in chromosomes, genes, repetitive interrupted DNA, chromatin remodeling.

#### Unit – II

Molecular mechanism of gene regulation: Regulation of gene expression in prokaryotes, regulation of gene expression in eukaryotes, promoters, enhancers, silencers and insulators, posttranscriptional and posttranslational events, DNAprotein interactions.

Unit – III Cellular signaling and trafficking: Cell signaling and signal transduction, protein trafficking, protein localization and molecular chaperones. Cellular physiology and molecular biology of specialized tissues: Molecular biology of cancer and ageing, molecular and genetic control of apoptosis, mechanism of HIV infection.

Unit – IV Genomics and proteomics: Cloning a genome, genome sequencing, sequence comparisons and alignment, data mining for gene hunting, useful tools and websites on the internet for genome sequencing, gene arrays, comparative genomics, proteomics, metabolomics, pathway analysis.

Ref. books: T.A. Brown, Frief Fielder, Primrose.

Paper - III

Plant Physiology (M.Phil.BOT 113)

Maximum Marks: 100 Times Allowed: 3 Hrs.

Unit - I Diffusion and water potential, Osmosis, Photosynthesis, Chloroplasts and Light, Photosynthesis Environmental and agricultural aspects, Transpiration, The Ascent of sap, Mineral Nutrition, Absorption of mineral salts, Transport in the phloem.

Unit - II Enzymes, Proteins, Amino Acids, Carbon Dioxide fixation and Carbohydrate synthesis, Respiration, Assimilation of Nitrogen and Sulfur, Lipids and Other natural products.

Unit - III Growth and Development, Hormones and Growth regulators Auxins and Gibberellins, Hormones and Growth Regulators Cytokinins, Ethylene, Abscisic Acid, and Other Compounds,

Differential Growth and Responses to temperature, Photoperiodism, Differentiation, Photomorphogenesis, Biological Clock, Growth

Unit - III - Environment, Environmental Physiology Principles of plant response to environment,

Ecotypes: The role of Genetics, Plant Adaptations to the radiation environment, Allelochemicals and Allelopathy, Herbivory.

Stress Physiology - Stress, Stressful environments, Water Stress: Drought, Cold, and Salt, Mechanisms of plant response to water and related stresses, Chilling Injury, High Temperature Stress, Acidic soils, Other Stresses.

Ref. books: 1. Salisbury & Ross Plant Physiology.

2. V.K. Jain Introduction to Plant Physiology.