

**S.S. Jain Subodh P.G. (Autonomous) College, Jaipur**

**M.Sc. Botany Semester I Assignment – October 2025**

**PAPER-I**

**Cell Biology and Evolution**

**Attempt any four questions**

**Max. Marks -30**

**UNIT-I**

Q.1 Explain the mechanism of protein sorting in Endoplasmic reticulum and chloroplast.

OR

Write short notes on:

- a. Protein localization in mitochondria.
- b. Protein targeting in the nucleus.

**UNIT – II**

Q.2 Write short notes on:

- a) Cell cycle
- b) roles of cyclin and Cyclin-dependent kinases (CDKs) in cell division

OR

What are the general principles of cell communication? Discuss cell adhesion and roles of different adhesion molecules.

**UNIT- III**

Q.3 Write short notes on:

- i) Apoptosis
- ii) Cancer and oncogenesis

OR

Write short notes on any two:

- i) Darwinism
- ii) Concept of Oparin and Haldane

iii) origin of Eukaryotic cells

#### UNIT-IV

Q.4 Write short notes on (any two):

1. Migration and random genetic drift.
2. Evolutionary time scale.
3. Allopatric and Sympatric speciation.

OR

What is Hardy-Weinberg law? Explain its concepts and rate of change in gene frequency with suitable examples.

### **Paper-II: Morphology and Diversity of Non-Vascular Plants**

**Attempt any four questions (one from each unit)**

**Max Marks 30**

#### Unit I

Q1. Write a detailed note on range of thallus in Algae with the help of suitable diagrams. 7.5

OR

Q2. Write a short note on any two: 4+3.5

- a) Life cycle patterns in Algae
- b) Economic importance of Algae
- c) Life Cycle of Laminaria (Diagrammatic Representation)

#### Unit II

Q3. Describe the recent trends in classification of fungi with phylogenetic relationship of groups. 7.5

OR

Q4. Write short note on (any two) 4+3.5

- a) Parasexuality in fungi
- b) Lifecycle Patterns
- c) Heterothalmsm

### Unit III

Q5. Give a detailed account on life cycle of *Neurospora* with its significance in genetics.

Draw neat labelled suitable diagram. 7.5

OR

Q6. Write short note on (any two) 4+3.5

- a) Poisonous Fungi
- b) *Drechslera* or *Colletotrichum*
- c) Basidiocarp of *Polyporus*

### Unit IV

Q7. Describe the general characteristics and classification of Bryophytes. 7.5

OR

Q8. Write short note on (any two) 4+3.5

- a) Reproductive structure of *Plagiochasma*
- b) Sporogonium of *Notothylus*
- c) Sterilisation of sporogenous tissue in bryophytes

## **Paper- III, Biology and Diversity of Microbes**

### Unit-I

Q1. Write detailed note on the Bergey's manual of systematic bacteriology.

Q2. Write note on- (any two)

- a. Mycoplasma
- b. Nutritional classification of microbes
- c. New trends of classification

### Unit- II

Q 3. Describe morphology and ultrastructure of bacterial with special reference to cell wall and endospores.

Q4. Write note on- (any two)

- a. Archaeobacteria
- b. Life cycle and Pathogenesis of retero virus
- c. Life cycle of any DNA viruses

### Unit-III

Q5. Write note on-

a. Antibody structure and function b. Humoral and Cell mediated immune responses

Q6. Write note on- (any two)

a. Vaccination b. Activation and differentiation of B- cell

c. antigen- antibody interaction

### Unit-IV

Q7. Explain microbial fermentation with upstream and downstream processing techniques. Explain production of alcohol with help of flowchart.

Q8. Write note on- (any two)

a. Biofertilizers b. Microbial spoilage of foods production

c. Biofilms d. Sewage treatment methods

## **Paper- IV - Plant Ecology and Environment**

**Attempt any four questions**

**Max Marks: 30**

### Unit -I

Q1. What are biological interactions. Describe the various interspecific and intraspecific positive interactions with suitable examples.

Or

Write Short note on any two:

1. Characterization of population
2. Scramble and contest competition mode
3. Population growth curve

### Unit -II

Q.2 Write short note on any two.

- i. Concepts of community and continuum
- ii. Species diversity
- iii. Ecological niche

Or

Write short notes on -

- i. Succession models
- ii. Mechanism of succession
- iii. Concept of climax

#### UNIT -III

Q 3. Write short notes on any two:

- a. Energy flow models
- b. Restoration of ecosystem
- c. Cybernetics and Homeostasis in ecosystem

Or

Write short notes on –

- a. Productivity of various ecosystems
- b. Types of food chains and food webs
- c. Phosphorus cycle

#### UNIT -IV

Q 4. Give detail account on Biodiversity assessment, loss of Biodiversity and conservation.

Or

write short notes on-

- a. Major biomes of the world
- b. Natural resource management in changing environment

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**Assignment M.Sc. III Semester Botany**

**Paper I: Molecular Biology**

**Session 2025-26**

MM= 30

Answer any two questions:

Unit I

Q.1 Explain the chemical, physical , spectroscopic and thermal properties of DNA in detail. (15)

Q. 2 Write short notes on: (Any two) (7.5 x 2 =15)

- a. DNA replication in Prokaryotes
- b. DNA damage and recombination repair mechanism
- c. Pre-replication complex in Eukaryotes

Unit II

Q. 3. Explain in detail transcription in Eukaryotes with diagrammatic sketches. (15)

Q.4. Write notes on: (7.5 x 2 =15)

- a. Mediators and silencers
- b. RNA splicing and processing

Unit III

Q. 5. Explain translation initiation, elongation and termination in Prokaryotes with the help of diagrammatic sketches.

Q.6. Write notes on : (7.5 x 2 =15)

- a. Regulation of gene expression in Prokaryotes with the help of Lac operon
- b. Histone modifications

Unit IV

Q. 7. Explain different tools and techniques used in DNA cloning . (15)

Q. 8 Write notes on (Any two): (7.5 x 2 =15)

- a. DNA Hybridization
- b. DNA Sequencing methods
- c. DNA footprinting and Fingerprinting
- d. Polymerase Chain Reaction

## **Paper- II -Taxonomy of Angiosperms**

**Attempt any four questions**

**Max Marks:30**

Unit –I

Q 1. What is speciation? Describe various models of speciation with the types and mechanism of speciation.

Or

Q 2. Write short notes on- any Two

- a. Population Concept
- b. Taxonomic hierarchy
- c. Biosystematics methods

Unit-II

Q 3. Write short notes on-

- a. Monographs and Icons
- b. Herbarium

Or

Q 4. Write a detail account on the Molecular techniques and GIS and mapping of Biodiversity as Taxonomic tools.

Unit-3

Q 5. Write about Photochemistry and embryology as taxonomic evidence in relation to Taxonomy with examples.

Or

Q 6. Give details of basics and outline of Classification system of Dahlgren with merit and demerits.

Unit-4

Q 7. Compare the following families –any2

- a. Apocynaceae and Asclepiadaceae
- b. Subfamilies of Fabaceae
- c. Solonaceae and convolvulaceae

Or

Q 8. Describe various theories proposed for the origin of Angiosperms or details of primitive angiosperms.

**Paper III, MBOT: 303 Morphology and Developmental Anatomy of Angiosperm**

**Attempt any two questions (Each question is of 15 marks)**

**Max Marks: 30**

**UNIT - I**

Q. 1 Write short notes on (any two):

- a) Phases of seed germination
- b) Basic concepts of development.
- c) Mobilization of carbohydrates and proteins during seed germination

OR

Q.2 How are the mutants important in understanding seedling development? Discuss role of different genes expressed during seedling development in detail.

**UNIT – II**

Q. 3 What do you mean by SAM? With the help of suitable diagrams, discuss the various theories related to SAM in detail.

OR

Q.4 Write explanatory notes on (any two):

- i) Cytological and molecular analysis of SAM
- ii) Secretory ducts
- ii) Laticifers
- iii) Primary and secondary tissue differentiation in the stem

**UNIT – III**

Q. 5 Write short notes on the following:



- i) Phyllotaxy
- ii) Differentiation of epidermis in stomata and trichomes
- ii) Leaf trace and Leaf gap

OR

Q. 6 What is a floral meristem? Discuss the genetics of floral organ differentiation and homeotic mutants in Arabidopsis and Antirrhinum.

UNIT – IV

Q. 7 Write short notes on (any two):

- a) Organization and development of root apical meristem (RAM) and associated theories.
- b) Development of lateral roots.
- c) Mycorrhizae

OR

Q. 8 Write a short note on

- a) the internal and external morphology of monocot and dicot seeds.
- b) Spermoderm pattern

### **Elective 304(A)- Advanced Plant Pathology-1**

**Max Marks:30**

**Attempt any two questions:**

Unit-I

- Q1. Describe the effect of pathogen on plant physiological functions.
- Q2. Describe the effect of environment factors on plant disease development.

Unit-II

- Q.3 Describe the symptoms, causal organism, disease cycle and control measures of Early Blight of Potato.
- Q4. Write a complete detail on symptoms, causal organism, disease cycle and control measures of Crown Gall of Stone fruits.

### Unit-III

Q5. Write a detail account on gall development, host parasitic interaction and physiology of insect induced gall of Pongamia.

Q.6 Define Phytoplasmic disease. Describe symptoms, causing organism, disease cycle and control measurement of Little leaf of Brinjal.

### Unit-IV

Q7. Describe various symptoms produced by nematode and their inter relationship with other plant pathogens.

Q8. Describe the symptoms, causal organism, disease cycle and control measures of Soyabean cyst nematode.

## **PAPER-IV (B)**

### **SEED SCIENCE AND TECHNOLOGY –I**

**Attempt any four questions**

**Max Marks: 30**

#### UNIT-I

Q.1 What are the main objectives of seed testing? How it is important in agriculture.

OR

Write short notes on any two:

- a) Physical and genetic purity analysis.
- b) Seed viability test.
- c) Seedling evaluation.

#### UNIT-II

Q.2 Write a detailed note identification and structure of wheat seed.

OR

Write short notes on any two:

- a) Hybrid seed production.
- b) Terminator seed technology.
- c) Weed seeds and their effects in seed production.

#### UNIT-III

Q. 3 Discuss the physiological and metabolic changes during seed germination in detail.

OR

Write short notes on the following (any two):

- a) Mycotoxins
- b) Seed longevity.
- c) Principles of safe seed storage.

UNIT-IV

Q.4 Write a detail note on Indian Seed Act and recent amendments.

OR

Write short notes on any two:

- a) ISTA rules and recommendations.
- b) Seed certification standards
- c) Quarantine regulations.