

**S.S. Jain Subodh P.G. College, Jaipur (Autonomous)**  
**M.Sc. IV Sem. (Botany)**  
**Paper-I Embryology of Angiosperms**  
**Assignment March -2026**

Unit-I

Q1. . Give an illustrated account of the different types of tetrasporic embryo sacs you have studied..  
(7.5)

Or

Q.2 Write notes on: - 7.5

- (a) Tapetum
- (b) Male gametophyte development

Unit-II

Q3. What is self-incompatibility? Describe sporophytic and gametophytic self incompatibility in plants.  
7.5

Or

Q4. Write notes on: - 7.5

- (a) Pollen-pistil interaction
- (b) Pollination

Unit-III

Q5. Describe molecular biology and biochemistry of fruit maturation. 7.5

Or

Q6. Write notes on: -

- (a) Polyembryony
- (b) Types of Endosperm

Unit-IV

Q7. Give an account of metabolic changes associated with senescence influence of hormone and effect of environmental factors on senescence. 7.5

Or

Q8. Write notes on: - 7.5

- (a) Seed dormancy
- (b) PCD

**M.Sc. Sem. IV (Botany)**

**Paper II- Plant Resource utilization and Ethnobotany**

Max.Marks-30

Unit I

1. Give a detailed account of evolution, origin, botanical characters ,cultivation improved varieties and economic importance of Maize. 7.5

or

2. Write short note on : 7.5

(1) Oil yielding Plants

(2) Fibre yielding plant

Unit-II

3. Write short note on- 7.5

(1) Timber-yielding plants

(2) Mastigatories and Fumitories

Or

4. Write short note on- 7.5

(1) Plant used in sericulture

(2) Petrocrops

Unit III

5. Write a detailed account on protective areas. 7.5

Or

6. Write short note on- 7.5

(1) Cryopreseservation

(2) Wetland conservation

Unit IV

7. Write short note on - 7.5

(1) Indian Agriculture research Institute

(2) BSI

Or

8. Write short note on- 7.5

(1) Ethnic Group of Indian

(2) Role of Ethnobotany in National health care.

**M.SC IV Sem (Botany)**

**Paper III- Plant Biotechnology and Genetic Engineering**

**MM= 30**

**Answer any four questions selecting at least one question from each unit:**

**Unit I**

Q.1. Write in detail culture media ingredients, methods of sterilization and aseptic techniques used in Plant Tissue Culture. (7.5)

Or

Q.2. Write short notes on: (7.5)  
a. Callus and suspension cultures  
b. Somatic embryogenesis

**Unit II**

Q. 3 Discuss the role of metabolic engineering in the manipulation of phenylpropanoids / Shikimic pathway. (7.5)

Or

Q.4. Write notes on: (7.5)  
a. Biotransformation  
b. Hairy root culture

**Unit III**

Q.5. Write a detailed note on Agrobacterium-mediated gene transfer, the process of T-DNA transfer and integration, practical applications of Agrobacterium mediated gene transfer. (7.5)

Or

Q.6 Write notes on: (7.5)  
(a) CRISPR-Cas 9 system  
(b) Role of genetic engineering in plants for herbicide tolerance

**Unit IV**

Q. 7. Write a note on Public acceptance of genetically modified crops with ethical issues and public concerns and the regulation of GM crops. (7.5)

Or

Q.8. Write notes on : (7.5)  
a. Molecular farming for carbohydrates  
b. Phylogenetic analysis and bioinformatics in drug discovery

**M.SC IV Sem. Botany**  
**Paper-IV (A) Advance Plant Pathology-II**  
**Assignment**

**Answer one question from each unit**

**Max Marks 30**

**(7.5x4= 30)**

UNIT-I

1. What is forecasting? Describe various methods use in plant disease forecasting.

Or

Define Epidemic. Describe the role of various factors responsible for the establishment of an epidemic

UNIT-II

2. Write a brief account on various regulatory methods in plant disease management.

Or

Describe the role of traditional and nontraditional plant growth regulators in plant disease response and management.

UNIT-III

3. Describe Resistance. Discuss various type of plant resistance to pathogen.

Or

Write a detailed note on plant breeding to produce disease resistant plants with suitable examples.

UNIT-IV

4. How biotechnology impinges upon the plant pathology? Give a brief account of tissue culture and genetic engineering technique important to plant pathology.

Or

Write short note on

- a) Genetics of host pathogen interaction
- b) Molecular mechanism of resistance

**M.Sc. Botany Semester IV**  
**PAPER-IV (B)**  
**SEED SCIENCE AND TECHNOLOGY –II**

UNIT-I

Q1. Describe the history and development of seed pathology. Discuss the major milestones, important scientists and how the field has evolved over time to ensure seed health and quality. 7.5

OR

Write short notes on: 7.5

- a. Seed washing test
- b. Nucleic acid based methods of pathogen identification

Unit-II

Q2. Explain different environment factors affecting seed infection. 7.5

OR

Write short notes on: 7.5

- a. Embryonal infection
- b. Anatomy of seed in relation to invasion

UNIT-III

Q.3 Write a detail note on smut and bunt of wheat. Mention causal organism, symptoms, disease cycle and control measures. 7.5

OR

Write short notes on: 7.5

Bacterial blight

- a. Pea seed born mosaic

UNIT-IV

Q.4 Write a detail account on biological and chemical methods of seed treatments. 7.5

OR

Write short notes on: 7.5

- a. Factors affecting seed transmission
- b. Systemic and non systemic seed transmission

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**M. Sc. (Botany) Sem-II**

**Assignment, March 2026**

**Paper-I, Genetics and Plant Breeding**

**Max Marks 30**

**UNIT-I**

Q.1. Write Short notes on (any two): 7.5

- a) Discuss various laws of inheritance given by Mendel
- b) Cytoplasmic male sterility
- c) Penetrance and expressivity

OR

What do you mean by site-specific recombination? Discuss FLP/FRT and Cre/lox recombination in detail. 7.5

**UNIT-II**

Q.2 what is mutation? Discuss mutations induced by transposons. 7.5

OR

Write short notes on any two: 7.5

- i) SOS repair mechanism
- ii) Insertional mutagenesis
- iii) In vitro mutagens and deletion techniques

**UNIT-III**

Q.3 Write short notes on (any two): 7.5

- i) Linkage Map
- ii) RAPD
- iii) Mapping by using somatic hybrids

OR

Write a detailed note on origin, occurrence, production and meiosis of autopolyploids and allopolyploids. 7.5

**UNIT-IV**

Q.4 Write short notes on (any two): 7.5

- a) Nuclear DNA content and C-value paradox
- b) Cot curve and its significance
- c) FISH

OR

Discuss the role of plant breeding in improving protein quality and drought stress tolerance in crop plants. 7.5

**M.Sc. Semester II**  
**Paper II - Morphology and Diversity of Vascular Plant**

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

**Max Marks 30**

Unit I

Q1. Write a short note on : 7.5

- a) Classification of Pteridophytes
- b) Types of Life cycles in Pteridophytes

Or

Give a brief account of fossil Pteridophytes: 7.5

- (a) Lepidodendron
- (b) ( b) Calamites

Unit II

Q2. Explain origin and evolution of stele in pteridophytes. 7.5

Or

Write a short note on: 7.5

- a) Sporangia of Gleichenia
- b) Sporocarp of Azolla

Unit III

Q3. Write a detail note on economic importance of Gymnosperm with suitable examples. 7.5

Or

Write short notes on: 7.5

- a. Embryogeny of Taxus
- b. Pre and post pollination changes in Gnetum

Q4. What is fossilization? Give a detailed account on types of fossils. 7.5

Or

Write short notes on: 7.5

- a. Pteridospermales
- b. Fossil study techniques

**M.Sc. Semester II**  
**Paper III - Phytopathology**

Answer one question from each unit.

Max Marks 30

Unit-I

1. Define Symptom. Give an account of symptoms of plant diseases produced by different pathogens with suitable illustration. 7.5

Or

Define Pathogenesis. Write a note on biotic and abiotic factors on pathogenesis. 7.5

Unit-II

2. Describe morphological defense mechanism in plants against pathogen with suitable illustrations. 7.5

Or

What is toxin. Describe the role of various toxins in plant disease developments with suitable examples. 7.5

Unit –III

3. Describe symptoms, causal organism, disease cycle and control mechanism of Flag smut of wheat with suitable diagram. 7.5

Or

Give an account of symptoms, etiology, control mechanism of Tundu disease with suitable illustration.

Unit-IV

4. Describe symptoms, causal organism, disease cycle and control mechanism of root knot of brinjal with suitable diagram. 7.5

Or

Write short note on following: 7.5

- a) Symptoms of Cadang disease of Coconut
- b) Mango necrosis

**M.Sc. Semester II**  
**Paper IV – Plant Physiology and Metabolism**

Unit-I

Q.1 Transpiration is an essential evil or unavoidable evil. Give justification of your answer. 7.5

Or

Give a detailed account of carbohydrates, their classification, and biological importance. 7.5

Unit-II

Q2. What is oxidative phosphorylation? Give a detail account on electron transport chain. 7.5

Or

Write short notes:- 7.5

- a. Photorespiration
- b. Photosynthetic pigments

Unit-III

Q3. Write a detail account of the lipid biosynthesis and oxidation ( $\alpha$  and  $\beta$  oxidation). 7.5

Or

Write short notes:- 7.5

- a. Nodule development
- b. Structure and function of Riboflavin

Unit-IV

Q4. Write a detail note on physiological role, bioassay and mode of action of Gibberellin. 7.5

Or

Write short notes:- 7.5

- a. Plant inhibitors
- b. Brassinosteroids