

Printing Pages : 2

Paper Code: MSC-BOT-403

A

(SVSU:2024-25/R)

Enrollment No.

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Program Name: M.Sc. Botany
IV Semester /II Year Examination
Subject Code: MSC-BOT-403
Subject Name: Plant Biotechnology

[Time : 03:00 Hours]

[Max. Marks : 70]

Note : Attempt all the questions as per given instructions.

1. Multiple Choice Questions (MCQs)

[01×15=15]

- I** Which of the following is a key advantage of micropropagation?
 (a) Production of genetically identical plants
 (b) Production of diverse crops
 (c) Slow plant growth
 (d) Less efficient than traditional methods
- II** Hybridization is commonly used in agriculture to:
 (a) Maintain pure species
 (b) Improve plant characteristics
 (c) Decrease yield
 (d) Control pests
- III** The process of removing the cell wall from a plant cell to create a protoplast is called:
 (a) Protoplast fusion
 (b) Enzymatic digestion
 (c) Electroporation
 (d) Somatic fusion
- IV** Seed banks are an example of:
 (a) Germplasm conservation
 (b) PCR
 (c) Gel electrophoresis
 (d) DNA fingerprinting
- V** The optimal temperature for plant tissue culture is typically:
 (a) 10-15°C
 (b) 20-25°C
 (c) 30-35°C
 (d) 40-45°C
- VI** In hybrid seed production, the term 'parental lines' refers to:
 (a) The first generation of plants
 (b) The original parents used for crossing
 (c) The offspring of the hybrid
 (d) Plants that are genetically identical
- VII** Which of the following is a common technique for hybrid production in plants?
 (a) Pollination
 (b) Grafting
 (c) Embryo rescue
 (d) Crossbreeding
- VIII** The technique is best for storing vegetatively propagated plants?
 (a) Cryopreservation
 (b) Anther culture
 (c) PCR
 (d) DNA hybridization
- IX** Protoplast culture involves the:
 (a) Fusion of isolated plant cells
 (b) Separation of DNA fragments
 (c) Formation of proteins
 (d) Study of RNA molecules

- X** What is the main purpose of anther culture?
 (a) Produce haploid plants (b) Increase seed production
 (c) Improve plant nutrition (d) Develop polyploid plants
- XI** Hybridization is commonly used in agriculture to:
 (a) Maintain pure species (b) Improve plant characteristics
 (c) Decrease yield (d) Control pests
- XII** The most commonly used vector in gene cloning is:
 (a) Plasmid (b) mRNA (c) tRNA (d) Protein
- XIII** Which hormone induces root formation?
 (a) Auxin (b) Cytokinin (c) Gibberellin (d) Ethylene
- XIV** Callus formation in tissue culture is promoted by:
 (a) Light (b) Temperature changes
 (c) Growth hormones (d) Pollination
- XV** PCR is used for:
 (a) Amplifying DNA (b) Cutting DNA
 (c) Cloning genes (d) Separating proteins
- 2. Answer in long (any three) [10×3=30]**
- I** Describe the principle, steps, and applications of Southern blotting. How does it differ from PCR-based techniques?
- II** What is plant tissue culture? Explain its types and importance in plant biotechnology.
- III** What is cryopreservation? Explain its importance in germplasm conservation and long-term storage of plant materials.
- IV** What are transgenic plants? Discuss their method of development and their utility.
- 3. Answer in short (any five) [5×5=25]**
- I** Explain the role of restriction enzymes in genetic engineering.
- II** Write a note on applications of recombinant DNA technology in medicine.
- III** Explain the role of radioactive or fluorescent probes in blotting techniques.
- IV** Write a note on meristem culture. Also explain its advantages.
- V** Describe the process of anther culture and its applications.
- VI** Define totipotency and its significance in tissue culture.
- VII** Explain the concept of protoplast culture and its applications.

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Paper Code: MSC-BOT-203

C

(SVSU:2024-25/R)

Enrollment No.

M.Sc. Botany

II Semester / 1st Year Examination

MSc-BOT-203

Cytogenetics and Molecular Biology

[Time : 03:00 Hours]

[Max. Marks : 70]

Note : 1. Attempt all the questions as per given instructions.

1. Multiple Choice Questions (MCQs)**[01×15=15]**

- I** Where are most ATPs generated in a cell?
a)Nucleus b)Golgi apparatus c)Mitochondria d) Lysosome
- II** Which of the following is a type of membrane protein involved in signal transduction?
a) Carrier protein b) Channel protein
c) Receptor protein d) Structural protein
- III** The term "C-value paradox" refers to:
a) The number of ribosomes in a cell
b) The relationship between chromosome number and organism complexity
c) The inconsistency between genome size and biological complexity
d) The packaging of DNA in mitochondria
- IV** Which organelle contains its own circular DNA and ribosomes?
a)Nucleus b)Mitochondria
c)Ribosome d) Endoplasmic Reticulum
- V** In a dihybrid cross, the phenotypic ratio 9:3:3:1 represents:
a)Codominance b) Complete dominance
c)Independent assortment d) Linkage
- VI** Genetic recombination occurs primarily during
a)DNA replication b)Translation c)Transcription d) Meiosis
- VII** Which structural chromosomal alteration involves a piece of a chromosome being reversed end to end?
a)Deletion b)Duplication c)Inversion d) Translocation
- VIII** Which of the following is *not* typically found in prokaryotic gene expression?
a)Operons b)Introns c)Promoters d) Repressors
- IX** Initiation of cancer at the cellular level often begins with:
a) RNA transcription errors
b) Apoptosis
c) Mutation in DNA repair genes or oncogenes
d) Increase in translation efficiency.

- X Cancer cells typically have:
 a) Normal apoptosis rates
 b) Controlled cell cycles
 c) Increased mutations in DNA repair genes
 d) Reduced transcription rates
- XI Which of the following does *not* result in a change in the amount of genetic material?
 a) Deletion b) Duplication c) Inversion d) Insertion
- XII Which mutagen is most likely to cause thymine dimmers in DNA?
 a) Benzene b) X-rays c) UV radiation d) Nitrous acid
- XIII Grana in chloroplasts are stacks of:
 a) Stroma b) Thylakoids c) Cristae d) Chromoplasts
- XIV Which of the following is *not* found in the nucleus?
 a) DNA b) Nucleolus c) Ribosomes d) Chromatin
- XV Heterochromatin is—
 a) Lightly stained and transcriptionally active
 b) Densely stained and transcriptionally inactive
 c) Only found in mitochondria
 d) Present only in bacteria
- 2. Answer in long (any three) [10×3=30]**
- I Describe the structure of the plant cell wall and explain how it supports and protects the cell.
- II Explain the structure and role of the chloroplast in photosynthesis. Discuss the packaging of DNA into chromosomes in eukaryotic cells
- III Explain how molecular maps are constructed using genetic marker? Include the use of RFLP, SNPs, microsatellites, and their importance in genomics
- IV Discuss how oncogenes and tumor suppressor genes interact in cancer development?
- 3. Answer in short (any five) [5×5=25]**
- I Define biogenesis and mention one organelle involved in this process
- II What are receptors in the context of plasma membranes and what do they do?
- III Describe the basic structure of a nucleosome.
- IV What is the significance of polytene chromosomes in cytogenetics?
- V Differentiate between complete and incomplete linkage
- VI What is the role of transposons in gene mutation?
- VII Name two types of structural chromosomal alterations

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Paper Code: MSC-BOT-406

B

(SVSU:2024-25/R)

Enrollment No.

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M.Sc. Botany

IVth Semester / IInd Year Examination

MSC-BOT-406

Plant Health Management

[Time : 03:00 Hours]

[Max. Marks : 70]

Note : 1. Attempt all the questions as per given instructions.

1. Multiple Choice Questions (MCQs) [01×15=15]**I Late blight of potato is caused by:**

- (a) Erysiphe (b) Phytophthora
(c) Pythium (d) Sphacelotheca

II The primary method of controlling seed-borne diseases is—

- (a). Chemical spraying (b). Crop rotation
(c). Seed treatment (d). Soil fumigation

III The main function of mycorrhiza in plants is to:

- (a) Fix nitrogen (b) Help in pollination
(c) Aid in water and mineral absorption (d) Prevent transpiration

IV Leaf rust of coffee got introduced into India from:

- (a) Australia (b) China (c) Thailand (d) Sri Lanka

V Disease causing micro-organism among these is—

- (a) Pathogens (b) Bacteria (c) Archaea (d) Protozoa

VI Mycorrhizal association is absent in:

- (a) Pinus (b) Orchid (c) Brassicaceae (d) Eucalyptus

VII Arbuscules and vesicles are characteristic structures of:

- (a) Ectomycorrhiza (b) Endomycorrhiza
(c) Orchid mycorrhiza (d) Actinorrhiza

VIII The term "IPM" stands for:

- (a) Integrated Pest Monitoring (b) Integrated Plant Maintenance
(c) Integrated Pest Management (d) Internal Pest Management

IX Tomato wilt is commonly caused by:

- (a) Fusarium oxysporum (b) Phytophthora infestans
(c) Rhizoctonia solani (d) Albigo candida

X A common symptom of nematode infestation in roots is—

- (a) Leaf scorch (b) Root galls (c) Blight (d) Chlorosis

XI The primary vector for Citrus Greening disease is—

- (a). Whitefly (b) Mealybug
(c) Citrus psyllid (Diaphorina citri) (d) Aphid

- XII** Powdery mildew in cucurbits is primarily caused by:
 (a) *Erysiphe cichoracearum* (b) *Sclerotinia sclerotiorum*
 (c) *Alternaria alternata* (d) *Botrytis cinerea*
- XIII** Bordeaux mixture is a combination of:
 A) Copper sulfate and quicklime (b) Copper sulfate and sulfur
 (c) Copper oxychloride and lime (d) Lime and sulfur
- XIV** The whip-like structure seen in smut of sugarcane is known as:
 (a) Flag leaf (b) Smut sorus (c) Stroma (d) Mycelial mass
- XV** The common scab of potato is caused by:
 (a) *Streptomyces scabies* (b) *Fusarium oxysporum*
 (c) *Ralstonia solanacearum* (d) *Pythium aphanidermatum*
- 2. Answer in long (any three) [10×3=30]**
- I** Compare chemical vs. biological methods of disease control in terms of effectiveness and environmental safety.
- II** Discuss the implications of climate change on the prevalence of plantation diseases.
- III** Discuss the impact of plant diseases on agriculture and food security.
- IV** Describe bio-deterioration of seeds in storage and its control measure with suitable examples.
- 3. Answer in short (any five) [5×5=25]**
- I** Define plant health management and its objectives.
- II** Write a note on any two bacterial and two fungal plant diseases with their causal organisms.
- III** What is the difference between pesticide and fungicide?
- IV** Explain the importance of sanitation and hygiene in disease management in plant nurseries.
- V** Discuss the role of soil-borne pathogens in plantation crop failures.
- VI** Briefly explain the control measures of cereal diseases growing in the field.
- VII** How plants defend themselves from pathogen?

Printing Pages : 2

Paper Code: MSC-BOT-202

B

(SVSU:2024-25/R)

Enrollment No.

Program Name: M.Sc. Botany

II Semester / I Year Examination

Subject : Reproductive Biology, Morphogenesis and Tissue Culture

Subject Code: MSC-BOT-202

[Time : 03:00 Hours]

[Max. Marks : 70]

Note : Attempt all the questions as per given instructions.

1. Multiple Choice Questions (MCQs) [01×15=15]
 - I What is the primary purpose of using cryopreservation in germplasm storage?
 - (a) To prevent plant diseases
 - (b) To store seeds for future use
 - (c) To protect plants from genetic degradation
 - (d) To keep plant tissues alive
 - II In megasporogenesis, how many megaspores are typically produced?
 - (a) One
 - (b) Two
 - (c) Three
 - (d) Four
 - III Which of the following is the correct order of events in megasporogenesis?
 - (a) Meiosis → Megaspore → Fertilization
 - (b) Fertilization → Meiosis → Megaspore
 - (c) Megaspore → Fertilization → Meiosis
 - (d) Meiosis → Fertilization → Megaspore
 - IV Which of the following is a key advantage of micropropagation?
 - (a) Production of genetically identical plants
 - (b) Production of diverse crops
 - (c) Slow plant growth
 - (d) Less efficient than traditional methods
 - V The optimal temperature for plant tissue culture is typically:
 - (a) 10-15°C
 - (b) 20-25°C
 - (c) 30-35°C
 - (d) 40-45°C
 - VI In hybrid seed production, the term 'parental lines' refers to:
 - (a) The first generation of plants
 - (b) The original parents used for crossing
 - (c) The offspring of the hybrid
 - (d) Plants that are genetically identical
 - VII Which of the following is a common technique for hybrid production in plants?
 - (a) Pollination
 - (b) Grafting
 - (c) Embryo rescue
 - (d) Crossbreeding
 - VIII In angiosperms, fertilization involves the fusion of:
 - (a) Male and female gametes
 - (b) Two sperm cells
 - (c) Pollen tube and style
 - (d) Pollen grain and ovary
 - IX The cotyledons in dicot plants arise from:
 - (a) Embryonic leaf
 - (b) Radicle
 - (c) Plumule
 - (d) Epicotyl

- X** Which of the following occurs during microsporogenesis in plants?
 (a) Meiotic division (b) Mitosis (c) Fertilization (d) Pollination
- XI** The male gametes in plants are formed in:
 (a) Ovule (b) Anther (c) Style (d) Pistil
- XII** The process of removing the cell wall from a plant cell to create a protoplast is called:
 (a) Protoplast fusion (b) Enzymatic digestion
 (c) Electroporation (d) Somatic fusion
- XIII** The purpose of using growth regulators in micropropagation is to:
 (a) Promote seed germination
 (b) Induce callus formation and organogenesis
 (c) Increase seed viability (d) Decrease plant growth
- XIV** Which of the following hormones is essential for shoot differentiation in tissue culture?
 (a) Auxin (b) Cytokinin (c) Gibberellin (d) Ethylene
- XV** Which of the following is NOT a stage in micropropagation?
 (a) Initiation (b) Multiplication
 (c) Acclimatization (d) Pollination
- 2. Answer in long (any three) [10×3=30]**
- I** Explain different methods used for germplasm storage. How do they help in preserving plant genetic diversity?
- II** What do you mean by organ culture? Discuss the process and significance of embryo culture in plant propagation.
- III** What is somaclonal hybridization? Discuss its advantages and disadvantages in plant breeding.
- IV** Discuss the role of pollen-pistil interaction in fertilization. How do plants prevent self-fertilization.
- 3. Answer in short (any five) [5×5=25]**
- I** Explain the role of tapetum in microsporogenesis.
- II** What is double fertilization? Explain its significance in angiosperms.
- III** Define totipotency and its significance in tissue culture.
- IV** Explain the process of organogenesis in plant tissue culture.
- V** Write a short note on ovule culture and its applications.
- VI** Which of the following is NOT a stage in
- VII** How is embryology useful in plant taxonomy? Explain it with suitable example.

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Paper Code: MSC-BOT-402

A

(SVSU:2024-25/R)

Enrollment No.

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M.Sc. Botany

IInd YEAR, IV Semester EXAMINATION

MSC-BOT-402

Medicinal Plant

[Time : 3:00 Hours]

[Max. Marks : 70]

Note: 1. Attempt all the questions as per given instructions.

1. Objective Questions: Answer All Questions. [15x1=15]

- I. Which of the following part of cinchona tree is used to treat malaria?
a) Bark b) Root c) Leaf d) Seed
- II. Which of the following belongs to medicinal Plant:
a) Lemon grass b) Wheat c) Sorghum d) None of these
- III. Vrikshayurveda belongs to:
a) Animals b) Cow c) Plant d) None of these
- IV. Gavayurveda term use in Ayurveda for:
a) Cows b) Horses c) Elephants d) All of these
- V. Demonology belongs to:
a) Kaya Chikitsa b) Bala Chikitsa
c) Graha Chikitsa d) Shalya Chikitsa
- VI. Which of the following plants contains drug at its bark for curing heart disease?
a) Mango b) Cinchona c) Arjuna d) Tobacco
- VII. Sattva term use in Ayurveda for:
a) Sensory organ b) Mind c) Soul d) None of these
- VIII. Kalka type of medicine formulation is—
a) Juicy extraction b) Medicinal Pastes
c) Decoctions d) None of these
- IX. Rajoguna belongs to:
a) Vata b) Pitta c) Kapha d) None of these
- X. Vasantha ritu is known as:
a) Autumn b) Spring c) Summer d) Rainy
- XI. Which one of the following is not included under In-situ conservation?
a) Sanctuary b) Botanical Garden
c) Biosphere reserve d) National Park

XII. Greeshma belongs to:

- a) Rainy b) Winter c) Summer d) Spring

XIII. Which of the following is best method of germplasm conservation?

- a) Botanical Garden b) Seed Bank
c) Herbarium d) Zoological Park

XIV. Lavana term used in Ayurveda for:

- a) Bitter b) Sour c) Salty d) Sweet

XV. Abhisanga term use in Ayurveda for:

- a) Injuries b) Infection c) Fracture d) None of these

2. Long Question: Answer Any Three

[10×3=30]

- I. Describe about the scope and importance of medicinal plants.**
- II. What is the role of natural products for treatment of fever and cardiac disease in humans?**
- III. Define the plant propagation. Give its significance in medicinal plants cultivation.**
- IV. Give explanatory notes on:**
a) Sidha System b) Pita, and vata

3. Short Questions: Answer Any Five.

[5×5=25]

- I. Give the short notes on grafting technique in medicinal plants.**
- II. What do you mean types of Rasayana?**
- III. Give the comments on basic tastes in universe.**
- IV. Explain the role of Green house in medicinal crops.**
- V. Write a short note on Botanic garden.**
- VI. Describe about the Unani medicine system.**
- VII. Give the short notes on In-situ conservation and Ex-situ conservation of plant.**

09/05/2025

Printing Pages :2

Paper Code: MSC-BOT-201

B

(SVSU:2024-25/R)

Enrollment No.														
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Program Name: M.Sc. Botany
II Semester / I Year Examination

Subject Code: MSC BOT-201

Subject Name- Taxonomy of Angiosperms
and Economic Botany

[Time : 03:30 Hours]

[Max. Marks : 70]

Note: 1. Attempt all the questions as per given instructions.

I. Multiple Choice Questions (MCQs)

[01×15=15]

I Numerical taxonomy was first proposed by:

- (a) Linnaeus (b) Sokal and Sneath
(c) Takhtajan (d) Hutchinson

II Which of the following is NOT the part of four whorls of flower leaves?

- (a) Calyx (b) Corolla (c) Androecium (d) Stem

III Artificial classification fails to consider:

- (a) Plant height (b) Leaf arrangement
(c) Evolutionary lineage (d) Flower color

IV The name of a plant must be published in:

- (a) Any language (b) Local dialect
(c) Latin or English (d) French only

V What have been set up to take care of natural heritage?

- (a) Setting up of Wildlife Sanctuaries (b) Setting up of National Parks
(c) Setting up of all these (d) Setting up of Zoological Gardens.

VI The mode of classifying plants as shrubs, herbs and trees comes under-

- (a) Artificial classification (b) Natural classification
(c) Phylogenetic classification (d) Whittaker's classification

VII Which of the following is not a function of a botanical garden?

- (a) Conservation of plant diversity (b) Industrial plant production
(c) Public education (d) Research and training

VIII Royal Botanic Gardens, Kew is located in which country?

- (a) Australia (b) United States (c) United Kingdom (d) South Africa

IX Who introduced coffee in India?

- (a) Baba Budan (b) Gojong (c) Shen No (d) None of the above

X National Botanical Research Institute is located in:

- (a) Dheradun (b) Delhi (c) Gangtok (d) Lucknow

XI Who is known as the "Father of Taxonomy"?

- (a) Aristotle (b) Carl Linnaeus (c) Theophrastus (d) John Ray

- XII** The unit of study in numerical taxonomy is called:
 a) Species (b) Family (c) OUT (d) Order
- XIII** Engler and Prantl proposed a:
 (a) Natural system (b) Artificial system
 (c) Phylogenetic system (d) None
- XIV** Oldest botanical garden in the world is—
 (a) Missouri Botanical Garden (b) Kew Gardens
 (c) Orto Botanico di Padova (d) Indian Botanical Garden
- XV** Which scientist used molecular data to propose a phylogenetic tree of life?
 (a) Linnaeus (b) Whittaker (c) Carl Woese (d) Aristotle
- 2. Answer in long (any three)** [10×3=30]
- I** Explain the importance of numerical taxonomy in modern plant classification.
- II** Give a detailed account on international rules of Botanical Nomenclature.
- III** Describe the significance of the Eastern Himalayas as a biodiversity hot spot for indigenous flora.
- IV** Differentiate between artificial, natural, and phylogenetic systems of classification with examples.
- 3. Answer in short (any five)** [5×5=25]
- I** Discuss about need and aim of nomenclature.
- II** How do angiosperms differ from gymnosperms in taxonomy?
- III** Mention any three roles of botanical gardens in biodiversity conservation.
- IV** Name five important medicinal plants indigenous to India and their uses...
- V** Define economic botany and its scope.
- VI** Discuss about the utilization of fiber and timber plants.
- VII** Give a detailed account on herbarium.