Exam Code: 225203 **Paper Code: 3223**

Programme: Master of Science (Botany) Semester-III

Course Title: Developmental Botany

Course Code: MBTL-3071

Time Allowed: 3 Hours **Max. Marks: 60**

Note: Attempt one question in all, selecting atleast one question from each section. Fifth question can be attempted from any section. Each question carries 12 marks.

SECTION-A

1 Describe different methods used to overcome incompatibilities in plant breeding. 12

2 Discuss the significance of pollen-pistil interaction in plant reproduction. 12

SECTION-B

3 Describe the events from the entry of the pollen tube into the ovule up to the fusion of gametes. 12

4 Differentiate between the various types of endosperm based on their developmental patterns. 12

SECTION-C

5 i. Explain the concept of zygote polarization and its significance in the early stages of embryogenesis in plants. 6

ii. Describe the process of embryogenesis in monocot embryo. 6

6 What is a seed? Describe the structure and development of seeds in angiosperms. 12

SECTION-D

7 Describe the diagnostic embryological characters used in plant taxonomy. 12

8 i. Discuss the causes and implications of endosperm dysfunction in plant hybrids. 6

ii. Describe the phenomenon of arrested embryo development in plant hybrids. 6

Exam Code: 225203 **Paper Code: 3224**

Programme: Master of Science (Botany) Semester: III

Course Title: Plant Molecular Biology

Course Code: MBTL-3072

Time Allowed: 3 Hours **Max Marks: 60**

Note: Candidates are required to attempt five questions in all, selecting at least one question from each section. The fifth question may be attempted from any Section. Each question carries 12 marks.

Section - A

Que 1 Write a note on: - 6+6

a. Organization of transcription units

b. C-Value Paradox

Que 2 Explain Mechanism of DNA Sequencing? 12

Section - B

Que 3 Writes a note on

a. Genomic DNA and cDNA libraries?

b. Agarose Gel Electrophoresis. 6+6

Que 4 Describe the Biological and Physical Containment of Recombinant DNA clones? 12

Section - C

Que 5 Write note on: - 6+6

a. M13 Vector b. Expression Vector

Que 6 Discuss the lysogenic and lytic cycles of bacteriophage? 12

Section - D

Que 7 write note on: - 6+6

a. Organization of T-DNA

b. DNA Fingerprinting by RFLP.

Que 8 Write a note on: - 6+6

a. Molecular markers for transgenic plants

b. Protein profiling and its significance.

Exam Code: 225203 **Paper Code: 3225**

Master of Science (Botany) Semester III

Course Title: Plant Breeding and IPR

Course Code: MBTL-3073

Time: 3 Hours **Max. Marks: 60**

Note: Attempt five questions, selecting one question from each section. The fifth question can be attempted from any section. Each question carries 12 marks. Draw labelled diagrams wherever necessary.

Section-A

1. Write a note on the following
   a. Plant introduction and it types.
   b. Domestication.
   c. Utilization of wild plants in crop improvement. (4 X 3 = 12)
2. Discuss in detail about the inheritance of male sterility and its types with the help of diagram. (12)

Section-B

3. Discuss about the recurrent selection as a breeding methodology and its advantages. (12)
4. Write a note on the following
   i) Inbreeding depression.
   ii) Clonal Selection. (6 X 2 = 12)

Section-C

5. Explain in detail the multiline varieties, its procedure and advantages with the help of diagram. (12)
6. Write a Short Note
   i. Path analysis and Discriminant function.
   ii. Cluster analysis. (8, 4)

Section-D

7. Explain in about the aneuploidy and polyploidy as method of plant breeding. (12)
8. Write about laws and conventions related to intellectual property rights. Write a short note on biosafety. (12)

Exam Code: 225203 **Paper Code: 3226**

Programme: Master of Science (Botany) Semester-III

Course Title: Plant Biochemistry

Course Code: MBTL – 3074

Time Allowed: 3 Hours **Max Marks: 60**

Note: Candidates are required to attempt five questions in all, selecting atleast one question from each section. The fifth question may be attempted from any section. Each question carries twelve marks.

Section –A

1. Describe the structure and properties of water and its biological significance.
2. Describe the Handerson-Haselbach equation in detail.

Section –B

3. Explain the role of Acetyl Coenzyme –A in cellular metabolism.
4. Explain in detail the complete process of glucose metabolism.

Section –C

5. Explain the metabolism of Sphingolipids.
6. Explain the process of beta-oxidation of fatty acids.

Section –D

7. Write a note on
   a) Activation Energy b) Induced –Fit theory
8. Explain the Michaelis-Menton Equation of Enzyme kinetics.

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Exam Code: 225203 **Paper Code: 3227**

Master of Science (Botany) Semester III

Course Title: Applied Botany

Course Code: MBTL-3075

Time: 3 Hours **Max. Marks: 60**

Note: Attempt five questions, selecting one question from each section. The fifth question can be attempted from any section. Each question carries 12 marks. Draw labelled diagrams wherever necessary.

Section-A

1. Write notes on any three of the following:
   i) Botanical description of any two fruit plants.
   ii) Spices and Condiments. Give botanical name, family, plant part used and uses of any four spices in tabulated form.
   iii) Processing of Tea
   iv) Fumitory substances (3 X 4 = 12)
2. Define beverages. Discuss the processing of Tea.

Section-B

3. Explain the industrial manufacturing of plywood and its classification based on their uses.
4. Bamboo: The "Green Gold" of India. Explain why this title is justified.

Section-C

5. Differentiate between essential oils and vegetable oils. Give classification, botanical description and uses of any two-essential oil yielding plants.
6. Give classification of Fibres. Mention physical and chemical processes involved in manufacturing of fibres.

Section-D

7. What is the source of commercial rubber? Describe the methods used to extract latex for rubber production, the process of transforming latex into the final product, and its various uses.

8. What are natural dyes? Write down their extractionmethods, merits and demerits of plants-based dyes.

Exam Code: 225203 **Paper Code: 3228**

Programme: Master of Science (Botany) Semester – III

Course Title: Plant Morphogenesis

Course Code: MBTL – 3076

Time: 3 Hours **Max. Marks: 60**

Note: Candidates are required to attempt five questions in all, selecting at least one question from each section. Fifth question may be attempted from any section. Each question carries 12 marks.

Section - A

1. Write note on:
   i. Polarity
   ii. Genetic correlations in relation to growth
   iii. Polarity in isolated cell
2. Discuss in detail Physiological manifestation of polarity and development patterns in angiosperms.

Section - B

3. Explain in detail about types of symmetries and factors regulating these symmetries.
4. Write short notes on:
   i. Growth
   ii. Differentiation
   iii. Development

Section - C

5. Elucidate different mechanisms of regeneration in lower plant organisms and how they differ from regeneration in higher plants?
6. Write note on:
   i. Stock-Scion interrelations
   ii. Chimeras and their types

Section - D

7. Define amorphous structures and their development in plants.
8. Discuss in detail factors affecting morphogenesis in plants.