Roll No. ------------------

**BOT-554**

**Plant Molecular Biology and Biotechnology**

M.Sc. Botany (MSCBOT)

2ndYear Examination 2024 (Dec.)

**TIME: 2 Hours Max Marks: 70**

Note: This paper is of Seventy (70) marks divided into two (02) Sections A and B. Attempt the questions contained in these sections according to the detailed instructions given therein.***Candidates should limit their answers to the questions on the given answer sheet. No additional (B) answer sheet will be issued.***

**SECTION – A**

**Long-answer - type questions**

**Note: Section ‘A’ contains Five (05) long-answer-type questions of Nineteen (19) marks each. Learners are required to answer any two (02) questions only.**

 **(2×19=38)**

1. What are restriction enzymes or restriction endonucleases? Describe in detail their role in recombinant DNA technology?

2- What is a transgenic plant? Describe the advantages and controversies associated with them?

3. Write a detailed account on IPR. How do patents differ from other intellectual property rights (IPR)?

4- Define micropropagation. Describe stages, importance and limitations of micropropagation?

5-Describe the technique used in protoplast culture. What are the factors affecting the protoplast and its viability?

**SECTION – B**

**Short – answer – type questions**

**Note: Section ‘B’ contains eight (08) short- answer type questions of Eight (08) marks each. *Learners are required to answer any Four (04) questions only.* (4×8=32)**

1-What is an “explant”? What are the requirements for establishing a tissue culture laboratory?

2-Differentiate between genomics and proteomics.

3-What is cryopreservation? Discuss it various applications in Biotechnology?

4- Describe the method for construction of DNA library?

5-What is Totipotency? Discuss its expression in-vitro?

6-What is a cloning vector? Why plasmids are used as cloning vectors?

7- Write short notes on the following:

(a) Molecular markers

(b) Trademarks

8. Discuss in brief various steps of Polymerase Chain Reaction (PCR)?