Seat No. : _____

# NH-138

**November-2025**

**M.Sc., Sem.-III**

**BOT-503 : Botany**

**(Plant Biotechnology)**

**Time : 2:30 Hours]** **[Max. Marks : 70**

**Instructions :** (1) **All** Questions carry equal marks.
(2) Attempt **all** Questions.

1. Discuss morphogenesis, somatic embryogenesis, synthetic seeds and their advantages in PTC. **14**

**OR**

1. (A) What is androgenesis and gynogenesis ? Discuss their significance in Plant tissue culture. **7**

(B) Describe the role of therapy methods (chemo and thermo) in producing virus free plants. **7**

2. Explain Somatic hybridization and its advantages. **14**

**OR**

2. (A) Write a note on bioreactors used for plant cell culture. **7**

(B) Explain the role of biotechnology in plant improvement with suitable examples. **7**

3. Describe in detail the industrial applications of secondary metabolites. **14**

**OR**

3. (A) Discuss the cytotoxic phytochemicals. **7**

(B) Explain one fine chemical produced by plants like Shikonine. **7**

4. Describe distant hybridization in detail with applications. **14**

**OR**

4. (A) Explain in-vitro pollination along with its applications and limitations. **7**

(B) Write short notes on embryo culture and embryo rescue in plant breeding. **7**

5. Attempt any **seven** out of **twelve** MCQs/Short question (**one** or **two** line answer)/ Fill in the blanks/True or False etc. **14**

(1) Name four plant growth regulators used in tissue culture.

(2) Explain pathogen indexing.

(3) Name two meristem cultures.

(4) What are hairy root cultures ?

(5) What are phytochemicals ? Give one example.

(6) What is biotransformation ?

(7) Mention source plant of Berberine.

(8) Define primary metabolites.

(9) What is the role of digoxin in medicine ?

(10) What are pre- and post- fertilization barriers ? Give one example for each.

(11) Define cisgenesis.

(12) Mention about cryoprotectants.