W 022/004

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Enrolment Number										

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Winter, 2024

M.Pharm 2nd Semester Examination

MEDICINAL PLANT BIOTECHNOLOGY

Course Code: MPG201T

Full Marks – 75 **Time – 3 hours**

The figure in the margin indicates full marks for the questions.

1. Answer the following questions: **(10 × 2 = 20)**

a) Outline the components of DNA and RNA.
b) Outline the discovery of Gottlieb Haberlandt and Hanning in tissue culture.
c) Differentiate between conjugation, transduction and transformation process.
d) Outline the significance of gene cloning.
e) Give the importance of recombinant DNA technique in plant science.
f) Give the significance of micropropogation.
g) Give the function of ligase, endonuclase and alkaline phosphatase.
h) Define the term totipotency and biotransformation.
i) Outline the different enzymes of pharmaceutical interest which are produced by fermentation technology.
j) Differentiate between organogenesis and embryogenesis with suitable examples.

2. Short answers (*any seven*) **(7 × 5 = 35)**

a) Discuss the applications of genetic and molecular biology in Pharmacognosy. (5)
b) Write a note on monoclonal variation citing suitable examples. (5)
c) Write a note on hairy root culture and multiple shoot culture. (5)
d) Discuss the various sterilization methods involved in Tissue culture techniques. (5)
e) Discuss the applications of PCR in plant genome analysis (5)
f) Write a note on single cell proteins citing suitable examples. (5)
g) Discuss the applications of immobilization techniques in the production of secondary metabolites.
h) Enumerate the various advantages and disadvantages of cell cloning (5)
i) Give an account on biotransformation and transgenesis with sutable examples (5)
j) Write a note on ***any one*** from the following: (5)
(i) Cloning of plant cell (ii) Transgenic plants (iii) Genetic code

3. Long answers (*Any two*) **(2 × 10= 20)**

a) Define protoplast and protoplast fusion. Describe in detail the different techniques involved in fusion a protoplast. Outline the importance of gene transfer in plants. (2+5+3)
b) Discuss in detail the basic principles and steps involved in DNA recombination technology. Write a note on gene expression and its regulations. (6+4)
c) Define fermentation technology. Discuss the applications of fermentation technology and explain the production of ergot alkaloids using such technologies. (1+4+5)