



GV – 52

B.Sc. (Semester – V) Examination, October/November 2016
BOTANY (Paper – XII)
Plant Biotechnology and Genetic Engineering

Duration : 2 Hours

Total Marks : 80

- Instructions :** 1) **All** questions are **compulsory**, however **internal choice** is available.
2) Briefly answer the sub-questions in Question 1 and Question 2.
3) Figures to the **right** indicate **maximum** marks per question.
4) **Draw** appropriate labelled diagrams **wherever** necessary.

1. Answer **any four** of the following. 16
- i) What are plant growth regulators ? Explain the role of any 2 in tissue culture.
 - ii) What are haploids ? State their significance.
 - iii) Give an outline of PCR mechanism.
 - iv) Briefly describe the basic steps involved in genetic engineering.
 - v) What is the role of enzymes in protoplast isolation ?
 - vi) Give the applications of bioinformatics in plant genomics.
2. Answer **any four** of the following. 16
- i) Write briefly on aseptic techniques in plant tissue culture.
 - ii) Comment on λ DNA as a cloning vector.
 - iii) Comment on production of hairy root cultures.
 - iv) Give an outline of the methods used for inducing fusion of protoplasts.
 - v) Write a note on production of cybrids.
 - vi) Describe the composition of biomass.
3. A) How is callus tissue formed ? Explain its characteristics. 6
- OR
- A) Write a brief account on meristem culture. State its applications. 6
- B) Describe the growth pattern of cells in a batch culture with the help of a graph. Add a note on types of continuous cultures. 6



4. A) Explain the role of restriction endonucleases and ligases in genetic engineering. 6

OR

- A) Explain the Western blotting technique. 6

- B) Explain the dideoxy method of DNA sequencing. 6

5. A) Describe any three methods employed for culturing protoplasts. 6

OR

- A) Give the protocol for plant transformation using *Agrobacterium tumefaciens*.
What is its limitation? 6

- B) With the help of suitable examples of transgenic plants, explain any three achievements of crop biotechnology. 6

6. A) Describe the construction and operation of a biogas plant. Add a note on the microbial reactions involved in production of methane. 6

OR

- A) What is bioremediation? Explain how plants are used in bioremediation? 6

- B) Write briefly on the rice genome. Add a note on its significance. 6