

**M.Sc. (Fourth Semester)**

**Examination, 2025**

**BOTANY**

**Instrumentation, Biostatistics, Remote Sensing  
and Biotechnology**

**Paper : II**

*Time Allowed : Three hours*

*Maximum Marks : 40*

*Note : Attempt questions all three sections as directed.  
Distribution of marks is given against each section.  
Section - 'A'*

**( Objective Type Questions )**

[5 × 1 = 5]

*Note : Attempt all the following questions. Each  
question carries 1 mark.*

1. Choose the correct answer :-
- (i) Which statement about bioremediation by microorganisms is INCORRECT?
- (a) Organic contaminants provide a source of carbon
- (b) The bacteria do not get net energy by degrading contaminants.
- (c) Bacteria can produce oxidized or reduced species that can cause metals of precipitation.
- (d) Bacteria act on contaminants by aerobic and anaerobic respiration.

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(ii) If a coin is tossed thrice, what is the probability of getting one or two heads?

- (a) 1/4
- (b) 3/8
- (c) 3/4
- (d) 1/2

(iii) Which of the following is a major application of computers in Biology?

- (a) Weather forecasting
- (b) Bioinformatics
- (c) Word processing
- (d) Accounting

(iv) Which of the following is a major application of remote sensing in natural resource management?

- (a) Crop monitoring
- (b) Forest mapping
- (c) Soil erosion detection
- (d) All of the above

(v) Which method is used to measure the colour of water-

- (a) Gravimetric analysis
- (b) Chromatography
- (c) Tintometer method
- (d) Hydrometer analysis

**Section - 'B'**

**( Short Answer Type Questions )**

[2 × 5 = 10]

**Note :** Attempt all five questions. One question from each unit is compulsory. Each question carries 2 marks.

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Write short notes on-

**Unit -I**

2. Electrophoresis

OR

Culture media

**Unit -II**

3. Mean

OR

Regression

**Unit -III**

4. Types of computer network.

OR

Uses of computers in biology.

**Unit -IV**

5. Concept of remote sensing.

OR

Digital interpretation

**Unit -V**

6. pH and conductivity.

OR

TSS and TDS

**Section - 'C'**

**(Long Answer type Questions)**

[5 × 5 = 25]

**Note :** Attempt all five questions from following. Each question carries 5 marks.

**Unit -I**

Attempt the following questions.

7. Explain the principles and process of chromatographic separation.

OR

Describe the different types of bioreactions and compare their applications, advantages and limitations.

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**Unit - II**

8. In a genetic experiment pea plants are classified as tall and short. Out of 160 plants, 120 are tall and 40 are short. The expected Mendelian ratio is 3 : 1 Test whether the observed data fits the expected ratio.

**OR**

Describe the steps involved in designing a sample for a large scale survey.

**Unit -III**

9. What are the most sensitive methods for detecting protein concentrations? What are the advantages of using fluorescent dye-based methods for protein detection?

**OR**

Explain the main components of Microsoft Office and describe their primary functions.

**Unit - IV**

10. What are the key characteristics of senses? Describe their importance.

**OR**

Explain the principle of satellite remote sensing and differentiate between active and passive remote sensing methods.

**Unit -V**

11. Describe the process and significance of hardness estimation in water analysis.

**OR**

Explain the health impacts of heavy metal contamination in drinking water. Illustrate with examples of specific metals and related diseases.

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