



বিদ্যাসাগর বিশ্ববিদ্যালয়  
**VIDYASAGAR UNIVERSITY**

**Question Paper**

**B.Sc. Honours Examinations 2021**

(Under CBCS Pattern)

**Semester - VI**

**Subject: BOTANY**

**Paper : DSE 4-T & P**

**Full Marks : 60 (Theory-40 + Practical-20)**

**Time : 3 Hours**

*Candidates are required to give their answers in their own words as far as practicable.*

*The figures in the margin indicate full marks.*

**Analytical Techniques in Plant Sciences**

**[Theory]**

1. Answer *any two* of the following: 2×15=30
- a) State the differences of Scanning and Transmission Electron Microscopy. Write differences between 'Mean and Median'. 9+6
- b) Describe shortly about the use of radioisotopes in biological research? Write a brief comparison on differential and density gradient centrifugation? 8+7
- c) Write a brief note on pulse chase experiment. What is the basic principle of X ray crystallography? 10+5

d) What is spectroscopy? Write its role in biological research. 7+8

2. Answer **any one** of the following: 1×10=10

a) What is the working principle of fluorescent microscopy? Write down the application of fluorescence microscopy? 5+5

b) What are the major functions of affinity and ion exchange chromatography? Write a short note on cryofixation. 6+4

### [Practical]

1. Answer **any one** of the following: 1×20=20

a.) What is Northern and Southern blotting? How does ELISA work? Write the steps of double staining for plant Anatomical specimen. Describe thin layer chromatography. 5+5+5+5

b.) Briefly describe Ultracentrifugation technique. Write down the working principle of HPLC? Write a short note on Electrophoresis? Write a note on Auto-Radiography? 5+5+5+5

c.) Write down the 'Types of sampling' in Biostatistics? Write a note on 'Chromosome banding'. 8+12

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## Research Methodology

### [Theory]

1. Answer **any two** of the following:

2×15=30

a). What is research? Mention the objectives of research. Differentiate applied and fundamental research. What is meant by quantitative research? Discuss the differences among descriptive and analytical research.

2+3+4+2+4=15

b). Why literature review is mandatory in research? Write notes on library, field and laboratory research.

3+(4+4+4)=15

c). What are the colours used for reagent bottle? Discuss on each type. Differentiate molar solution from molal solution. Define normality of common acid used in laboratory. How dehydration is done for a plant anatomical specimen using ethyl alcohol?

2+3 +3+3+4=15

d). What do you know about toxic chemicals? Name four toxic chemicals used in laboratory. How can we take precautionary measures during handling of toxic chemicals in laboratory? How imaging of tissue specimens may be made using scale bars? Why model organisms are used in biology research?

2+4+5+2+2=15

2. Answer **any one** of the following:

1×10=10

a). Distinguish between two:

i) Whole mount and peel mount

ii) Squash preparation and maceration

5+5=10

b.) What is fluorochrome? How radio-labelled isotopes are used in molecular biology research? Give an idea on cytological techniques used with squashed plant materials.

2+4+4=10

## [Practical]

Answer *any one* of the following:

1×20=20

1. (i) What is scientific writing? How one can use references as per style in research article? What is animation in power point presentation? What are the requisites essential for poster presentation? 2+3+3+2=10
- (ii) What is citation style used in academic writing? Write five references as example using APA style. 5+5=10
2. (i) Prepare a poster theme on Botanical aspect to be used in your College webinar programme on plant biodiversity. Name two softwares widely used for poster preparation. 8+2=10
- (ii) How ultra-thin sections are done in laboratory? Write some references as example using MLA style. 5+5=10
3. Write notes on:
  - (i) Scientific writing
  - (ii) Research ethics
  - (iii) Copy-right and academic misconduct
  - (iv) Landscape and portrait photography 5 × 4=20

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