

MSc DEGREE END SEMESTER EXAMINATION- MARCH 2025**SEMESTER 4 : BOTANY****COURSE : 21P4BOTT16 : BIOSTATISTICS, MICROTECHNIQUES AND BIOPHYSICS***(For Regular - 2023 Admission and Supplementary 2022/2021 Admissions)*

Duration : Three Hours

Max. Weights: 30

PART A**Answer any 8 questions****Weight: 1**

1. Elaborate on the use of microtomes for sectioning. (R, CO 1, CO 4, CO 6)
2. Differentiate between null and alternate hypothesis. (U, CO 1, CO 5)
3. Write a note on ultracentrifuge. (U, CO 2, CO 3, CO 4)
4. What are epoxy resins? How are they used? (R, CO 1, CO 4)
5. What are acidic, basic and neutral dyes? Which components of cells get stained by these? Give example. (R, CO 1, CO 4)
6. Discuss the application of probability in statistics. (An, CO 1)
7. What is the principle of polarisation microscope? (An, CO 4)
8. Differentiate between phase contrast microscope and fluorescence microscope. (E, CO 1, CO 2, CO 4, CO 6)
9. What are the principles of experimental design? (U, CO 1)
10. Differentiate standard deviation and standard error. (An, CO 3)
(1 x 8 = 8)

PART B**Answer any 6 questions****Weights: 2**

11. Write the composition and uses of FAA, FPA, and Carnoy's Fluid. (R, CO 1, CO 4)
12. Define pH of a medium. How do you calculate it? (U, CO 1, CO 3, CO 6)
13. What is maceration? Discuss different methods of maceration. (E, CO 1, CO 4)
14. What are the parts of a simple microscope? Justify why do we need advanced microscopes. (E, CO 1, CO 2, CO 4)
15. Explain ANOVA. (U, CO 1, CO 3)
16. Explain why you need to stick onto the steps of testing hypothesis? (An, CO 3)
17. What are dehydrating agents? Explain various types of dehydrating agents. (R, CO 1, CO 4, CO 6)
18. A research with a strong hypothesis justify the requirement of experimentation, discuss. (An, CO 1, CO 6)
(2 x 6 = 12)

PART C
Answer any 2 questions

Weights: 5

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| 19. | Compare correlation and regression. How they are useful in Biology? | (An, CO 1) |
| 20. | What is electron microscope? Discuss on the working and principle of TEM and SEM . | (E, CO 1, CO 2) |
| 21. | Discuss various natural and synthetic stains used in plant microtechnique. Explain the principle of staining. | (E, CO 1, CO 4) |
| 22. | Critically analyse and compare F-test and Chi-square test. Mention their respective applications in biostatistics. | (An, CO 1, CO 5, CO 6)
(5 x 2 = 10) |

OBE: Questions to Course Outcome Mapping

CO	Course Outcome Description	CL	Questions	Total Wt.
CO 1	Define the principles and phenomena in biostatistics, biophysics and microtechnique.	U	1, 2, 4, 5, 6, 8, 9, 11, 12, 13, 14, 15, 17, 18, 19, 20, 21, 22	41
CO 2	Explain the tools and techniques available for studding biochemical and biophysical nature of life.	A	3, 8, 14, 20	9
CO 3	Solve problems and research analysis with precision by applying biostatistical tools.	A	3, 10, 12, 15, 16	8
CO 4	Apply microtechniques and microscopic examination in histochemical studies.	A	1, 3, 4, 5, 7, 8, 11, 13, 14, 17, 21	19
CO 5	Analyse various statistical tools and its applications in data processing	An	2, 22	6
CO 6	Develop skill in statistical analysis, microtechnique and biophysics	A	1, 8, 12, 17, 18, 22	13

Cognitive Level (CL): Cr - CREATE; E - EVALUATE; An - ANALYZE; A - APPLY; U - UNDERSTAND; R - REMEMBER;