Reg. No ..... Name ..... **24P4040**

**M. Sc. DEGREE END SEMESTER EXAMINATION - MARCH 2024**

**SEMESTER 4 - BOTANY**

COURSE : **21P4BOTT16 - BIOSTATISTICS, MICROTECHNIQUES AND BIOPHYSICS**

*(For Regular 2022 Admission and Supplementary 2021 Admission)*

Duration : Three Hours Max. Weights: 30

**PART A**

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

| | | |
|---|---|---|
| 1. | How can you calculate the magnification of a compound microscope? | (A, CO 2, CO 4) |
| 2. | What are epoxy resins? How are they used? | (R, CO 1, CO 4) |
| 3. | Explain the assumptions of ANOVA. | (U, CO 1, CO 3, CO 6) |
| 4. | What is the principle of stereo microscope? | (U, CO 1, CO 4) |
| 5. | Differentiate standard deviation and standard error. | (An, CO 3) |
| 6. | Differentiate between natural and synthetic dyes. | (An, CO 1, CO 4) |
| 7. | Differentiate between sledge microtome and rotary microtome. | (An, CO 1, CO 4, CO 6) |
| 8. | What is experimental design. | (U, CO 1) |
| 9. | What is Pearson Correlation coefficient? | (U, CO 1) |
| 10. | Describe X-ray crystallography. | (A, CO 2, CO 4, CO 5, CO 6) |

**(1 x 8 = 8)**

**PART B**

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

| | | |
|---|---|---|
| 11. | Explain why you need to stick onto the steps of testing hypothesis? | (An, CO 3) |
| 12. | Summarize the preparation of paraffin blocks in plant microtechnique. | (U, CO 1, CO 4, CO 6) |
| 13. | Describe different stains used for whole mounts. | (An, CO 1, CO 4) |
| 14. | What are the parts of a compound microscope? Explain each of its significance. | (U, CO 2, CO 4, CO 6) |
| 15. | Explain the measures of dispersion with merits and demerits. | (An, CO 1, CO 3) |
| 16. | What is the principle of electrophoresis? Explain any three practical applications of electrophoresis. | (U, CO 3, CO 5) |
| 17. | Explain the different Killing and fixing fluids. | (R, CO 1, CO 4) |
| 18. | Explain Chi-square goodness of fit for two categories. | (U, CO 1, CO 3) |

**(2 x 6 = 12)**

**PART C**

**Answer any 2 questions** **Weights: 5**

| | | |
|---|---|---|
| 19. | What are the applications of Chi-square test? Write a note on level of significance, degrees of freedom and critical value. | (U, CO 1, CO 3) |
| 20. | Explain the working of fluorescence microscope. How does it differ from the a light microscope? | (U, CO 1, CO 4, CO 6) |
| 21. | Write an essay on binomial, normal and poisson distribution with examples. | (U, CO 1, CO 3) |
| 22. | What is staining? Explain its principle and discuss the different techniques of single, double and triple staining. | (E) |

**(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 | 2, 3, 4, 6, 7, 8, 9, 12, 13, 15, 17, 18, 19, 20, 21 | 32 |
| CO 2 | Explain the tools and techniques available for studding biochemical and biophysical nature of life. | A | 1, 10, 14 | 4 |
| CO 3 | Solve problems and research analysis with precision by applying biostatistical tools. | A | 3, 5, 11, 15, 16, 18, 19, 21 | 20 |
| CO 4 | Apply microtechniques and microscopic examination in histochemical studies. | A | 1, 2, 4, 6, 7, 10, 12, 13, 14, 17, 20 | 19 |
| CO 5 | Analyse various statistical tools and its applications in data processing | An | 10, 16 | 3 |
| CO 6 | Develop skill in statistical analysis, microtechnique and biophysics | A | 3, 7, 10, 12, 14, 20 | 12 |

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