

Instructions: All questions in Sections I & II carry equal marks

Illustrate your answers with neat diagrams wherever necessary.

Question 1 Write the following

- (i) What is variable and explain its types. (7 Marks)
- (ii) Write a note on ANOVA test. (7 Marks)

OR

- (i) How to choose the right statistical test? (7 Marks)
- (ii) Write a note on the chi-square test of Independence. (7 Marks)

Question 2 Write the following

- (i) Write short note on significance of research? (7 Marks)
- (ii) Explain justification of research problem. (7 Marks)

OR

- (i) Write applications of bioinformatics. (7 Marks)
- (ii) Write short note on identification of research problem? (7 Marks)

Question 3 Write the following

- (i) Describe the principle and instrumentation of Differential Interference Contrast Microscope. Add its applications (7 Marks)
- (ii) Discuss the principle and technique of Scanning Transmission Electron Microscope. Add its applications. (7 Marks)

OR

- (i) Explain the patterns of Illumination in Microscope. Add the description of any one of them. (7 Marks)
- (ii) Explain the methodology of Specimen preparation and processing for Bright Field Microscopy. (7 Marks)

Question 4 Write the following

- (i) Explain the filtration as method for separation of fermentation product from fermented broth (7 Marks)

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- (ii) What is Screening? Explain Primary screening of antibiotic producing (7 Marks) bacteria

OR

- (i) What do you mean by inoculum media and fermented media? Discuss (7 Marks) various nitrogen sources used for preparing industrial fermentation media
- (ii) Give a detailed account on: Sterilization of Air (7 Marks)

Question 5 Attempt any seven out of twelve

(14 Marks)

- (i) Give two differences between correlation and regression.
- (ii) Which statistic is applied for Mann Whitney U test?
- (iii) What are the significance level and confidence interval? And give its relations.
- (iv) Which of the following is an example of an independent variable?
- A) Blood pressure,
 - B) Age of participants,
 - C) Dosage of a medication administered
 - D) Weight loss
- (v) What is alternative hypothesis?
- (vi) What is experimental hypothesis?
- (vii) What role do molecular docking tools play in virtual screening?
- (viii) What is molecular dynamics (MD) simulation and what are its applications?
- (ix) Discuss the Relationship between Numerical Aperture and Magnification
- (x) Mention the role of Paraboloid Lens in Dark Field Condenser
- (xi) What are Secondary metabolites? Give two examples
- (xii) How we avoid the contamination in sterile fermentation