



**M.Sc. III Semester Degree Examination, April/May - 2024**

**MICROBIOLOGY**

**MB DSE - 1 : Research Methodology**

**(NEP)**

Time : 1 Hours

Maximum Marks : 30

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1. Which of the following is an example of theoretical research ?  
(A) Testing the efficacy of a new drug on Cancer cells in a laboratory setting  
(B) Developing a new mathematical model to explain ecological dynamics  
(C) Conducting surveys to assess public perception of genetically modified organisms  
(D) Analyzing the genetic diversity of a population using DNA sequencing techniques
  
2. Which of the following is a literature survey engine commonly used for academic research ?  
(A) Facebook      (B) Instagram      (C) Scopus      (D) Twitter
  
3. Bioethics is concerned with :  
(A) The ethical treatment of animals in research  
(B) The ethical implications of biotechnological advancements  
(C) The ethical behavior of scientists in the laboratory  
(D) The ethical distribution of research grants
  
4. Which of the following issues is NOT typically associated with bioethics in biotechnology and microbiology ?  
(A) Access and ownership of genetic resources  
(B) Environmental sustainability  
(C) Public acceptance of scientific research  
(D) Marketing strategies for biotechnological products
  
5. Which of the following is an example of an ethical conflict in biotechnology ?  
(A) Developing sustainable agricultural practices  
(B) Patenting a new pharmaceutical drug  
(C) Ensuring equal access to healthcare services  
(D) Introducing genetically modified organisms into the environment



6. Which regulatory framework is primarily responsible for overseeing bioethics in biomedical research ?
- (A) FDA (Food and Drug Administration)
  - (B) EPA (Environmental Protection Agency)
  - (C) NIH (National Institutes of Health)
  - (D) UNESCO (United Nations Educational, Scientific and Cultural Organization)
7. What is the main objective of public vs. private funding in biotechnological research ?
- (A) Maximizing profits for private investors
  - (B) Promoting equitable access to research resources
  - (C) Enhancing scientific collaboration among researchers
  - (D) Ensuring compliance with regulatory standards
8. What ethical principle is central to the debate surrounding the use of genetically modified organisms in agriculture ?
- (A) Environmental sustainability
  - (B) Respect for biodiversity
  - (C) Social responsibility
  - (D) Informed consent
9. Which of the following is NOT a strategy for enhancing ethical awareness in the scientific community ?
- (A) Providing education and training in research ethics
  - (B) Establishing codes of conduct and professional standards
  - (C) Encouraging scientific misconduct and fraud
  - (D) Promoting open communication and transparency
10. Which of the following is NOT a common source of literature for researchers ?
- (A) PubMed
  - (B) SciHub
  - (C) Spotify
  - (D) Web of Science
11. Which of the following is a method of data collection commonly used in scientific research ?
- (A) Survey
  - (B) Interview
  - (C) Experimentation
  - (D) All of the above
12. What is a key consideration when designing controlled experiments ?
- (A) Maximizing sample size
  - (B) Minimizing variability
  - (C) Ignoring potential biases
  - (D) Randomly selecting participants
13. What is the purpose of maintaining a lab notebook in scientific research ?
- (A) To record personal thoughts and reflections
  - (B) To document experimental procedures and observations
  - (C) To sketch chemical structures for reference
  - (D) To store data obtained from online database



14. In a case study, what distinguishes a well-designed experiment from a poorly designed one ?
- (A) The length of the report
  - (B) The number of variables controlled
  - (C) The complexity of the statistical analysis
  - (D) The inclusion of colorful graphs and charts
15. What are good laboratory practices aimed at ensuring ?
- (A) Maximizing personal convenience
  - (B) Minimizing ethical considerations
  - (C) Promoting safety and accuracy in experimental work
  - (D) Expediting the publication process
16. What is the purpose of an introduction to chemistry in scientific research ?
- (A) To provide background information on chemical elements
  - (B) To discuss historical advancements in chemistry
  - (C) To understand the basic principles underlying chemical reactions
  - (D) To memorize chemical equations
17. What is the primary purpose of choosing an approximate sample size in research ?
- (A) To increase the complexity of statistical analysis
  - (B) To ensure the generalizability of findings to the population
  - (C) To reduce the need for replication studies
  - (D) To limit the scope of the research project
18. How do independent replicates contribute to the reliability of experimental results ?
- (A) By increasing the likelihood of obtaining statistically significant findings
  - (B) By reducing the risk of experimental errors and biases
  - (C) By providing alternative interpretations of the data
  - (D) By facilitating peer review and replication studies
19. What is the purpose of conducting experiments in scientific research ?
- (A) To prove a hypothesis correct
  - (B) To generate data for statistical analysis
  - (C) To test the validity of a hypothesis through systematic observation and manipulation of variables
  - (D) To replicate previous studies exactly as they were conducted
20. What is the significance of maintaining accurate records in scientific research ?
- (A) To comply with legal regulations
  - (B) To facilitate replication of experiments by other researchers
  - (C) To impress funding agencies and journal editors
  - (D) To generate ideas for future research projects



21. What is a fundamental principle of technical writing ?  
(A) Using ambiguous language to captivate the reader  
(B) Including irrelevant details to enhance comprehension  
(C) Organizing information logically and coherently  
(D) Avoiding citations and references
22. What type of chart is best suited for representing categorical data ?  
(A) Line chart (B) Pie chart (C) Histogram (D) Scatter plot
23. What does the standard deviation measure in a dataset ?  
(A) The average value  
(B) The spread or dispersion of data points  
(C) The most frequently occurring value  
(D) The range of values
24. What is the purpose of plotting data and understanding error bars ?  
(A) To obscure the true pattern in the data  
(B) To visualize the distribution of values  
(C) To minimize the impact of outliers  
(D) To access the uncertainty associated with measurements
25. What type of distribution is commonly used to model continuous data with a symmetric bell-shaped curve ?  
(A) Normal distribution (B) Poisson distribution  
(C) Binomial distribution (D) Exponential distribution
26. What does the p-value represent in hypothesis testing ?  
(A) The probability of making a Type I error  
(B) The probability of making a Type II error  
(C) The probability of obtaining the observed results by chance  
(D) The level of statistical significance
27. What statistical test is used to analyze categorical data and assess the association between two categorical variables ?  
(A) Student's t-test (B) ANOVA  
(C) Chi-square test (D) Regression analysis
28. Which of the following is a characteristic of the Gaussian distribution ?  
(A) It is skewed to the right  
(B) It is symmetrical and bell-shaped  
(C) It is characterized by a long tail on the left side  
(D) It is used to model categorical data



29. What is the central idea behind inferential statistics ?
- (A) Making predictions based on sample data.
  - (B) Summarizing and describing the features of dataset
  - (C) Visualizing the distribution of values
  - (D) Testing hypotheses and making inferences about populations
30. What statistical technique is used to determine if there is a significant difference between observed and expected frequencies in categorical data ?
- (A) Descriptive statistics
  - (B) Regression analysis
  - (C) Chi-square test
  - (D) Correlation analysis

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