

- a) Combines statistical power from multiple studies. b) Summarizes opinions of experts.
 c) Provides case-specific conclusions only. d) Skips the need for literature search.
- (ix) Examine the role of NCBI in integrating literature and biological databases in bioinformatics.
 a) It offers video tutorials on genetics. b) It hosts a broad suite of integrated sequence and literature databases.
 c) It publishes books on lab techniques. d) It only provides clinical reports.
- (x) Apply k-means clustering to gene expression data for:
 a) Sorting genes alphabetically b) Grouping genes with similar expression
 c) Detecting mutations d) Calculating mean values
- (xi) Evaluate the importance of outlier detection before hypothesis testing.
 a) Outliers must be retained b) Outliers distort statistical assumptions and results
 c) Outliers improve accuracy d) Outliers are always errors
- (xii) Differentiate between structured and unstructured biological data with respect to data handling.
 a) Structured data is textual and qualitative; unstructured is numeric and quantitative b) Structured data includes sequences and tables; unstructured includes images and free text
 c) Unstructured data has fixed schema; structured does not d) Structured data cannot be analyzed statistically
- (xiii) Cite one international treaty on copyright protection.
 a) TRIPS b) Paris Agreement
 c) Berne Convention d) Montreal Protocol
- (xiv) Trace the organization that manages global patent cooperation.
 a) WTO b) UNESCO
 c) WHO d) WIPO
- (xv) Identify the database commonly used to check journal indexing.
 a) Scopus b) Turnitin
 c) MS Excel d) SPSS

Group-B

(Short Answer Type Questions)

3 x 5=15

2. Explain the two characteristics that distinguish analytical research from descriptive research. (3)
3. Discuss about the key components of a well-defined research problem. (3)
4. Illustrate the structure of a research proposal by describing the purpose of each section. (3)
5. Evaluate the usefulness of scatterplots in examining gene-gene relationships. (3)
6. Analyze the importance of Boolean operators in scientific literature search. (3)

OR

- Analyze the advantages of using PRISMA guidelines in systematic reviews. (3)

Group-C

(Long Answer Type Questions)

5 x 6=30

7. Analyze the role of bioinformatics databases (e.g., NCBI, EMBL-EBI) in literature-based research. (5)
8. Compare single-blind, double-blind, and open peer review systems in terms of transparency and bias prevention. (5)
9. Explain the role of international IPR treaties in harmonizing global intellectual property protection, with examples. (5)

10. Evaluate the effectiveness of PCA in reducing dimensionality of high-throughput biological datasets. (5)
11. Evaluate clustering output using internal and external validation metrics. (5)
12. Evaluate the use of citation metrics like h-index and impact factor in assessing research performance. (5)

OR

Evaluate the effectiveness of Mendeley and Zotero for collaborative referencing in academic writing. (5)

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