



LOYOLA COLLEGE (AUTONOMOUS), CHENNAI – 600 034

M.Sc. DEGREE EXAMINATION – BIOTECHNOLOGY

THIRD SEMESTER – NOVEMBER 2017

16PBT3MC03 – RESEARCH METHODOLOGY AND BIOINFORMATICS

Date: 06-11-2017

Dept. No.

Max. : 100 Marks

Time: 09:00-12:00

PART – A

Answer ALL the Questions

I. Choose the correct answer

(5 x 1 = 5 Marks)

- Process of randomly selecting intact groups within defined population sharing similar characteristics
 - Stratified sampling
 - Cluster sampling
 - Systematic sampling
 - Random sampling
- What type of graph would you use to see the distribution of a scale variable?
 - Bar chart
 - Pie chart
 - Histogram
 - Scatterplot
- The database that houses experimentally determined structures is
 - UniprotKB
 - PDB
 - SCOP
 - CATH
- Choose the heuristic based approach to study alignment
 - EMBOSS NEEDLE
 - EMBOSS WATER
 - BLAST
 - ProFam
- Which of the following tool is uses Parsimony to build phylogenetic tree.
 - Phylogeny.fr
 - PAUP
 - PHYLIP
 - MEGA

II. State whether the following are true or false.

(5x1=5 Marks)

- Nominal data is also called as variable data.
- Advantage of using syntax is that it can be saved and retrieved for subsequent analyses.
- ARSA can be used to search DDBJ if accession number is unknown.
- Homoplasy is a result of convergent evolution.
- The Jukes Cantor model assumes that all nucleotides occur at equal frequency.

III. Complete the following

(5 x 1= 5 Marks)

- _____ is an offline source of literature.
- The difference between the largest and the smallest observations is called as_____.
- Webin is a web based sequence submission tool at_____.
- _____ is a gene prediction tool that predicts almost 80% exons in human genes.
- _____ is a branching hierarchical tree that shows the relationship between clades.

IV. Answer the following within 50 words

(5 x 1 = 5 Marks)

- What is exploratory research?
- Write a note on t-test.
- What is the role of INSDC?
- Mention the importance of Clustal Omega.
- Define phylogenetics.

PART B

Answer the following each within 500 words.

(5 x 8 = 40 marks)

Draw diagrams wherever necessary

21. (a) Enumerate the different objectives of research.

OR

(b) Give a note on sampling and its types.

22. (a) Write about the SPSS software in statistics.

OR

b) Give a short note on spatial statistics.

23. (a) Write an account on sequence retrieval systems and sequence submission tools.

OR

(b) Give an account on the flat file format of Genbank.

24. (a) Compare the dynamic programming algorithm used for sequence analysis.

OR

(b) Write briefly about scoring matrix and its importance in sequence alignment.

25. (a) Illustrate UPGMA method of tree building.

OR

(b) Explain the neutral theory of evolution.

PART – C

Answer any TWO of the following, each within 1500 words.

(2 x 20 = 40 Marks)

Draw diagrams wherever necessary.

26. Explain in detail the components of a research proposal.

27. Describe the different methods of representation of data.

28. Write an essay on the various biological databases.

29. Elaborate on the different gene finding methods.
