

Registration Number:

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**ST JOSEPH’S UNIVERSITY, BENGALURU -27**

**M.Sc (Botany) – 2nd SEMESTER**

**SEMESTER EXAMINATION: APRIL 2024**

**(Examination conducted in May / June 2024)**

**BO 8223 Bioinformatics and Biostatistics**

**(For current batch students only)**

**Time: 2 Hours Max Marks: 50**

**This paper contains TWO printed pages and THREE parts**

**PART-A**

1. **Define or write a few sentences about any FIVE of the following. 5X2=10**
2. Create FASTA sequence format based on the data given below.

Seq: ACAAGATGCCATTGTCCCCCGGCCTCCTGCTGCTGCTGCTCTCCGGGGCCACGGCCACCGCTGCCCTGCC…..

Accession Number: AB000263

Description: descr=Homo sapiens mRNA for prepro cortistatin like peptide, complete cds

Length: 368

1. Suppose you have conducted research and discovered a new gene sequence, where do you deposit it based on your experience in bioinformatics?
2. You have got a protein sequence and you want to predict the protein structure, which tool will you use?
3. Suppose you got a protein molecule (PDB format) and you want see and study the molecule using various parameters, which tool will you use?
4. Differentiate between bar diagram and histogram.
5. You have a data set and you want to study the dispersion. Mention any two methods that you will use.
6. Which is the most popular measure and method of analyzing the variance?

**PART-B**

1. **Answer any FIVE of the following in detail. 5X6=30**
2. Imagine you have 10 similar sequences belonging to related organisms. You want to perform sequence analysis and obtain the phylogenetic tree. Write the protocol and describe the tool used to perform the above task.
3. Charles Darwin spent his lifetime to understand and explain evolution, which can now be studied in a few minutes. Explain the tool used in bioinformatics to study this phenomenon.
4. Explain the objectives and achievements of Human Genome Project.
5. Based on the data given data calculate mean, median and mode.

|  |  |  |  |  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- |
| X | 1 | 2 | 3 | 4 | 5 | 6 | 7 | 8 | 9 | 10 |
| f | 58 | 97 | 126 | 132 | 134 | 100 | 94 | 70 | 66 | 44 |

1. Explain skewness and kurtosis.
2. Write and explain the rules of probability.
3. Suppose you are planning for a research project and you have formulated a hypothesis, how will you test your hypothesis?

**PART-C**

1. **Answer any ONE of the following in detail. 10X1=10**
2. Define, classify and explain the biological databases.
3. Write critical notes on any TWO of the following (5 marks each)
   * + 1. Correlation and Regression
       2. Any three methods of sampling
       3. Protein Docking tool