**ST. JOSEPH’S COLLEGE (AUTONOMOUS), BENGALURU-27**

**M.Sc. BIOTECHNOLOGY - II SEMESTER**

**SEMESTER EXAMINATION: APRIL 2022**

**(Examination conducted in July 2022)**

**BT 8321: Bioinformatics and Computational Biology**

**Time- 2 ½ hrs                                                                                        Max Marks-70**

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

1. **Part A (Answer *ANY TEN* questions) 2mx10=20marks**
2. Expand CUI and GUI, and give examples.
3. What is OMIM?
4. What is KEGG?
5. What is E-value?
6. Define what are Character data and Distance data.
7. What is FastQC? Mention one of its applications.
8. Explain a) GEO database b) DEG
9. Name two tools used for the protein model evaluation.
10. What is docking? Explain with an example.
11. Describe ADMET and mention its implication in drug designing.
12. What is QSAR?
13. What is String database?

**II.        Part B (Answer *ANY FIVE* questions)                                 6mx5=30marks**

1. Explain how the BLAST algorithm works, using an example.
2. Describe Uniport Kb, Genbank and CATH.
3. What are the various phylogenetic tree construction methods? Give a brief account of what type of data is used, and how one decides which method to apply.
4. What are De novo assembly and Reference assembly? Give examples of tools which perform De novo and Reference assembly of genomes.
5. What are Genomics, Proteomics, Transcriptomics and Metabolomics? Explain with illustrations.
6. What is QSAR? Mention one application of QSAR.
7. What is docking? Using examples, explain the various types of docking.

**III.** **Part C (Answer *ANY TWO* questions)                                 10mx2=20marks**

1. Represent the various steps involved in NGS genome assembly and analysis in a flow chart and explain the different steps in detail. What are the applications of NGS in Genomics and Transcriptomics?

 **OR**

1. Perform the global alignment of the following DNA sequences using Needleman Wunsch algorithm. X – ATGCTGCA

 Y – AGTGCA

1. a. What is drug designing? Explain the various steps involved in drug designing.

**OR**

b. Explain protein homology modeling and describe how a modeled protein could be used as a tool for protein ligand docking?