

QP CODE: 25047695



Reg No : .....

Name : .....

**M.Sc DEGREE (CSS) EXAMINATION, NOVEMBER 2025**

**Third Semester**

M Sc Artificial Intelligence

**ELECTIVE - AI800302 - BIOINFORMATICS**

2019 ADMISSION ONWARDS

A946EFF7

Time: 3 Hours

Weightage: 30

**Part A (Short Answer Questions)**

*Answer any **eight** questions.*

*Weight **1** each.*

1. What do you mean by Sequence analysis?
2. Discuss the role of data cleaning and transformation in bioinformatics data management.
3. What are the key steps in DNA data analysis?
4. Explain the methods used for DNA data analysis and the interpretation of results.
5. Discuss the importance of genomic modeling in bioinformatics.
6. What are the applications of molecular modeling in the study of protein structures?
7. What is motif recognition, and why is it important in biological sequence analysis?
8. Describe the process of motif recognition in gene regulation.
9. What is gene network analysis and how is it used in microarray studies?
10. Explain the importance of background correction in microarray data analysis.

(8×1=8 weightage)

**Part B (Short Essay/Problems)**

*Answer any **six** questions.*

*Weight **2** each.*

11. Explain the examples of Structural Classification?
12. How does bioinformatics assist in drug discovery and development?
13. How are convolutional neural networks (CNNs) and recurrent neural networks (RNNs) applied in bioinformatics
14. Discuss the concept and applications of comparative modeling in bioinformatics.





15. Describe the structure and function of probabilistic Boolean networks.
16. Compare and contrast the one-dimensional and two-dimensional DNA walk models. How are these models used in bioinformatics?
17. Explain the principles and applications of microarray technology in genome expression studies.
18. Explain in detail image analysis for data extraction?

(6×2=12 weightage)

### **Part C (Essay Type Questions)**

*Answer any **two** questions.*

*Weight 5 each.*

19. Explore the challenges and methods involved in protein structure prediction. Discuss the importance of homology modeling, fold recognition, and ab initio methods in this context.
20. Discuss the importance of data quality in bioinformatics research. What are the common data quality issues, and how can they be addressed?
21. Discuss the impact of geographic isolation and environmental factors on divergent evolution. How does comparative modeling help in studying this phenomenon?
22. Explain the methodology and significance of two-dimensional portrait representation of DNA sequences.

(2×5=10 weightage)

