Roll No. ☐☐☐☐☐☐☐☐☐☐☐☐ **Total No. of Pages : 02**

Total No. of Questions : 08

M.Tech. (Bio Tech.) (Sem.–3)

ADVANCED BIOINFORMATICS

Subject Code : MTBT-203

M.Code : 23018

Time : 3 Hrs. **Max. Marks : 100**

INSTRUCTION TO CANDIDATES :

1. **Attempt any FIVE questions out of EIGHT questions.**
2. **Each question carries TWENTY marks.**

1. a) Write a note on NCBI database and its applications.

   b) Briefly describe PAM and BLOSUM matrices in pairwise alignment.

2. a) Briefly describe different approaches used in multiple sequence alignment. Write a q note on clustal W.

   b) By using Smith and Waterman algorithm align the following sequences: seq 1: CGTTCTA seq 2: AACGTTGG (Use 5 for match, -3 for mismatch and -4 for gap penalty).

3. a) Briefly describe the CHIP analysis.

   b) Briefly describe how do you find a motifs for a given protein sequence.

4. a) What are molecular visualization softwares? Discuss about Pymol and its importance.

   b) Briefly describe structural protein databases and their importance.

5. a) What is QSAR? How does it help to predict activity for new compounds?

   b) Briefly describe different chemistries involved in Real Time PCR.

6. a) Write a note on Dynamic programming algorithm for sequence alignment.

   b) Write a note on different phylogentic models used in reconstruction of phylogenetic trees.

7. a) Briefly describe how homology model building will be used in prediction of protein structure.

b) By using the following distance matrix, reconstruct a phylogenetic tree with By using UPGMA, reconstruct a phylogenetic tree for the following distance matrix :

	A	**B**	**C**	**D**	**E**	**F**
B	19	-	-	-	-	-
C	27	31	-	-	-	-
D	8	18	26	-	-	-
E	33	35	41	31	-	-
F	18	1	32	17	35	-
G	13	13	29	14	28	12

8. a) Briefly describe the importance of 2D gel electrophoresis in proteomics.

b) Briefly describe 13C NMR based metabolic flux analysis.

NOTE : Disclosure of Identity by writing Mobile No. or Making of passing request on any page of Answer Sheet will lead to UMC against the Student.