

Shahjalal University of Science and Technology
Department of Biochemistry and Molecular Biology
B.Sc. (Hons) 4th year 1st semester examination, 2014
Course No: BMB 423, Course name: Bioinformatics
Credit 3, Total marks: 70, Time: 3 hrs.

Instructions:

- **Part A: Answer any three (3), Time: 2 hrs, marks: 45.**
- **Part B: Answer from bioinformatic tools operation, Time: 1 hour, marks: 25.**

Part- A

1. a) What are the differences between Bioinformatics and Computational Biology? 2
b) What are the scopes and significances of Bioinformatics study? 3
c) What are the significances of sequence analysis study? 4
d) What are the popular tools for sequence alignment study? Why do we study the sequence alignment? 4
e) What do you mean by "Degree" in terms of biological network? 2
2. a) Define gene ontology and genome annotation. Compare and contrast between structural annotation and functional annotation 4
b) What is the purpose of the following tools?
i) PROSITE, ii) BLAST, iii) Clustal Omega, iv) DeepView, v) ExPASy, vi) Phylip. 5
c) Write down the basic steps of the algorithm implemented in ClustalW tool. 3
What are the limitations of this tool?
d) Write down the significance of phylogenetic tree analysis 3
e) What do you mean by Clustering coefficient? 2
3. a) What do you understand by the biological network? Discuss the significance of the biological network 3
b) How analyzing protein network can help you to predict the disease-causing-gene and its target drug? Explain with a suitable example ~~2.5~~ 5
c) What are the uses of PROSITE tool? 3
d) Define genomics and proteomics and illustrate their applications? ~~3~~ 4
4. a) What do you mean by gene regulatory networks? Describe the methods to investigate gene regulatory networks. 2+10=12
b) Briefly discuss on the evolutionary origin of scale-free networks 3