Printed Pages : 1 Roll No. NIT063

B. TECH.

THEORY EXAMINATION (SEM–VI) 2016-17

BIOINFORMATICS

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

Note : *Be precise in your answer. In case of numerical problem assume data wherever not provided.*

SECTION-A

1 Explain the following : **(10×2=20)**

a) What is bioinformatics?
b) Expand NCBI, EMBJ, DDBJ, and PIR.
c) Write a short note on interfaces?
d) What is informative site?
e) What is the role of microarray in bioinformatics?
f) Mention the various data mining tools, their description and classification.
g) Give examples of macromolecular structure data and point out the information present in it.
h) What are the three methods by which you can align a pair of sequence?
i) Define genetic distance and state two distances based phylogenetic tree prediction methods.
j) What type of information is obtained in a cluster analysis of microarray data? Explain with a suitable example.

SECTION-B

2 Attempt any five of the following: **(10×5=50)**

a) Classify and explain major databases in bioinformatics giving examples of each database.
b) Explain central dogma of molecular biology with neat diagram. Explain how it is an information science.
c) State and explain various data retrieval tools in bioinformatics. Explain the steps for data mining and knowledge discovery of biological databases.
d) What is structure visualization? Explain the various rendering tools in structure visualization.
e) Explain microarray spotting process flow in detail. How is microarray result analysis done?
f) Explain in detail the various methods of data mining for extracting patterns from data
g) Differentiate between clustering and classification. Explain hierarchical and k-means clustering in brief.
h) What is text mining? Explain NLP approach of text mining in detail, giving significance of each stage.

SECTION-C

Attempt any two of the following: **(15×2=30)**

3 Define bioinformatics. Explain bioinformatics applications related to the following areas :
   a) Phylogenetic Analysis.
   b) Genome Annotation.
   c) Proteomics.
   d) Drug Discovery.

4 Explain the basic machine learning process with neat diagram. Describe following machine learning processes in brief.
   a) Neural networks.
   b) Decision Trees.

5 Draw the collaboration – communication model. Explain collaboration and communication hierarchy in detail with neat diagram and appropriate examples.