

**M. SC. BIOINFORMATICS SEM.-III (2013 COURSE)**  
**(CHOICE BASED CREDIT SYSTEMS) : WINTER - 2017**

**SUBJECT: BIOLOGICAL DATA MINING**

**Day:** Monday  
**Date:** 30/10/2017

**W-2017-1017**

**Time:** 02.00 PM TO 05.00 PM  
**Max. Marks:** 60

**N.B:**

- 1) **Q. No. 1 and Q. NO. 5 are COMPULSORY.** Out of the remaining questions attempt **ANY TWO** from each sections.
- 2) Answer to both the sections should be solved in **SEPARATE** answer books.
- 3) Figures to the right indicate **FULL** marks.

**SECTION-I**

- Q.1** Answer in brief: (10)
- a) What are biological data types?
  - b) Diagrammatically explain flat file artifacts.
  - c) What are errors occurs in 3D structural data?
  - d) How micro array data gets authenticated?
  - e) What characteristics should be checked for sequence data?
- Q.2** Write short notes on: (ANY TWO) (10)
- a) Simulated annealing
  - b) Newton-Raphson method
  - c) Steepest Descent Method
- Q.3** Answer the following: (ANY TWO) (10)
- a) Differentiate between supervised and unsupervised genetic algorithm?
  - b) Explain with example utilization of genetic algorithms in bioinformatics.
  - c) Describe the drawbacks of genetic algorithms.
- Q.4** Give a detailed account on *Ab initio* methods for structure prediction. (10)

**OR**

Explain in detail DNA-array data analysis pipeline. How do you differentiate between significant and non-significant data with the help of it.

**SECTION-II**

- Q.5** Define the following with their applications. (10)
- a) Dot plot
  - b) GAP penalties
  - c) MSA
  - d) Smith Waterman algorithm
  - e) Cox- Jaynes Axiomes
- Q.6** Answer the following: (ANY TWO) (10)
- a) Explain in brief Needleman-Wunch algorithm.
  - b) Enlist and elaborate the homology modeling steps. Why we use it?
  - c) Describe any two structure validation methods.
- Q.7** Write short notes on: (ANY TWO) (10)
- a) Hidden Markov Model
  - b) Neural Network
  - c) Bayesian modeling
- Q.8** What is Ant cottony optimization? Explain its algorithm in detail. How this techniques could be utilized for biological data? (10)

**OR**

What is fuzzy logic system? Explain with example its applications in clustering and classification of proteins.

\* \* \* \* \*