

**NAVRACHANA UNIVERSITY, VADODARA**

School of Liberal Studies and Education

End-Semester Examination, November - 2017

FY MSc – Semester-1

Course: Computer Applications in Life Science (CS137)

Date: 30-Nov-2017

Time: 10:30am –12:30 pm

Marks: 40

**Instructions:** 1) Attempt questions of section 'A' and section 'B' on separate supplements  
2) Draw diagrams with pencil wherever necessary.

**Section A****Q.1 Choose the correct answer [1x3=3 marks]**

- a. Which one of the following is a protein sequence data base?  
a. EMBL                      b. SWISS PROT                      c. PROSITE                      d. TREMBL
- b. BLAST programme is used in \_\_\_\_\_.  
a. DNA sequencing                      b. Amino acid Sequencing                      c. DNA barcoding                      d. DNA homology
- c. The identification of drugs through genomic study is called as \_\_\_\_\_.  
a. Genomics                      b. Cheminformatics                      c. Pharmagenomics                      d. Pharmacogenetics

**Q.2 Answer in short the following questions ( Any three) [1x3= 3 marks]**

- a. State the principle of bioinformatics with examples
- b. What is NCBI? State the significance of it in bioinformatics.
- c. "Bioinformatics is hard for a common man but easier for a programmer". Justify
- d. Define FASTA alignment and state its application

**Q.3 Match the following [02 marks]**

- |   |                                      |
|---|--------------------------------------|
| a) <i>C.elegans Complete Genome</i>       | i. Transcriptomics                   |
| b) $\beta$ -chain bovine insulin sequence | ii. Quaternary structure of proteins |
| c) Microarray                             | iii. 1998                            |
| d) X-ray crystallography                  | iv. 1951                             |
|   | v. 2001                              |
|   | vi. amino acids                      |

**Q.4 Answer in detail (Any four) [3x4=12 marks]**

- a. Describe various approaches of bioinformatics.
- b. "Bioinformatics is integration of many fields" justify.
- c. Elucidate the various scoring pattern of a database for DNA homology search.
- d. Explain the major tasks and history of bioinformatics.
- e. List down the steps how one can search Human Thyroid gene sequence in NCBI.

### Section B

**Q.5** Write the inbuilt function to calculate the following mathematical operations in [05 marks]  
FORTRAN with example.

- a) To calculate square root of a given number
- b) To perform matrix multiplication
- c) To find absolute of a number

**OR**

Write the inbuilt functions available to find maximum and minimum value from an array. Also write the code for the same.

**Q.6** What is variance and standard deviation? Give the formulae for same. Explain [07 marks] with the suitable example.

**OR**

A computer hardware dealer is having sales data in the form of following data cube.

	2015	2014	2013	
Australia				
Canada				
India				
UK				
USA				
	Apple	Dell	HP	Lenovo

Draw the section of cube and write summation equation in the form of  $i, j, k$  for following queries and also calculate the number of cubes that represent the answer for above questions.

- a) Sales of Apple, Dell and HP in India in all years
- b) Sales of all products in UK, USA in 2014
- c) Sale of Dell and Lenovo in India and USA in 2015.

**Q.7** What is File handling in FORTRAN? How to open the file. Also write the syntax [04 marks] to read and write the file in FORTRAN.

**OR**

Write a Fortran Program to print sum of 'n' natural numbers.

**Q.8** Define the following terms

[04 marks]

- a) Coefficient of multiple determination for multiple regression ( $R^2$ )
- b) Slope
- c) Standard Error
- d) Intercept

\*\*\* End of Question Paper \*\*\*