2012

M.Sc.

3rd Semester Examination

BIOTECHNOLOGY

PAPER—BIT-304

Full Marks : 40

Time : 2 Hours

The figures in the right-hand margin indicate full marks.

Candidates are required to give their answers in their own words as far as practicable.

Illustrate the answers wherever necessary.

(Bioinformatics)

Group—A

1. Answer any *five* questions from the following : 5×2

(a) Define homologne, ortholog, paralog

(b) What is Gene ID, Codon bias, Pattern, CG islands.

(c) Name two sequence submission programme.

(d) What is Gap, Gap extension penalty in sequence alignment programe ? What type of statistical concept is used to assign value for the above cases.

(e) What is SNPs ? Give one example.

(f) What is SIGNAL SCAN and tRNA Scan ?

(g) What are SINEs and LINEs ? What are their utilities ?

(h) Define phylogenetic tree.

Group—B

Answer any *two* questions : 2×5

1. What is the difference between structural genomics and proteiomics ? And mention their applications. Define metabolome. 1+3+1

2. Define database, Classify biological database with two examples in each case. 1+4

3. Define NCBI, EMBL, and DDBJ. How the insulin sequence of *cavia porcellus* can be specifically retrived from the internet ? 3+2

4. Expand PAM and BLOSUM. How the number 62 and 250 signify in BLOSUM 62 and PAM 250 ? Mention the background frequency that are used in sequence similarity search method. 2+2+1

Group—C

Answer any *two* questions from the following : 2×10

1. Consider four species characterized by homologous sequences ATCC, ATGC, TTCG & TCGG. Taking the number of differences as the measure of dissimilarity between each pair of species, use a simple clustering procedure and derive phylogenetic tree.

10

2. (a) Perform a panwise sequence alignment between

(i) DOROTHYCROWFOOTHODGKIN

(ii) DOROTHYHODGKIN

by using Dot plot concept.

(b) State the significance of optimal alignment methods.

7+3

3. (a) What is the tertiary structure of a protein ?

(b) How can we predict the 3D-structure of a protein by homology modelling ?

(c) Describe the significance of 'Ramchandran Plot' with diagram.

1+6+3

4. Define bioinformatics. State the applications of bioinformatics. Give some example of emerging field of bioinformatrics.

1+8+2