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(July)

BIOTECHNOLOGY

(Honours)

(Genomics, Proteomics and Computer Application)

Marks : 56

Time : 3 hours

The figures in the margin indicate full marks for the questions

Answer Question No. 1 which is compulsory and
any **four** from the rest

1. Differentiate between the following
(any four) : $3 \times 4 = 12$
- (a) C and C
 - (b) Genes and Genomes
 - (c) Primary and Secondary databases
 - (d) VNTR and STR
 - (e) Tertiary and Quarternary protein structures

2. (a) Discuss the ethical, legal and social implications of human genome project. 5
- (b) Define C-value and G-value paradox. 2
- (c) Explain why the human genome project has helped scientist come closer to developing genetic engineering as a form of treatment. Support your answer with suitable examples. 4
3. Explain the following : $5+6=11$
- (a) Scope of functional genomics
 - (b) Structural genomics
4. (a) Define peptide bond. Explain the significant features of a peptide bond in proteins. Why do most of the peptide backbones assume trans-conformation? $2+3+2=7$
- (b) Mention the different kinds of covalent and noncovalent interaction that stabilize the protein structure. 4
5. (a) What are the primary differences between network operating system and distributed operating system? 2
- (b) Differentiate between pseudocode and flowchart. 2

(3)

- (c) Write the symbols for the following : 3
I/O, Flow, Terminal, Arrows, Decision & Output
- (d) Discuss the various data mining techniques with examples. 4
6. (a) What are the data types associated with C? 2
(b) Differentiate between declaration and definition of a variable. 2
(c) Explain the syntax errors in C program. 2
(d) Make a flowchart to input temperature of DNA molecule (T_m), if the T_m is less than 52°C , then print below 'below T_m ', or otherwise 'above T_m '. 5
7. (a) Explain the salient features of protein databases. 3
(b) Elaborate the various problems of biological data that are frequently observed. 4
(c) Write expansion of the following : $1 \times 4 = 4$
(i) EMBL
(ii) DDBJ
(iii) OMIM
(iv) Pfam

(4)

8. (a) What do you understand by sensitivity and specificity in BLAST? 2
(b) Discuss the applications of transcriptomics in solving various biological problems. 4
(c) How is bioinformatics knowledge useful in prediction of secondary structure of a protein? 5

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