2021

PHYSIOLOGY — HONOURS

Paper : SEC-B-2

(Bio-medical Technology and Bioinformatics)

Full Marks : 80

The figures in the margin indicate full marks.

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

Group - A

1. Answer ***any ten*** questions : 2×10

   (a) What is bioinformatics?

   (b) How is data mining done?

   (c) What is a search engine?

   (d) Define the term database.

   (e) Give two examples of primary database.

   (f) What is medical informatics?

   (g) What is meant by the term 'omics' in bioinformatics?

   (h) Name two tools used in phylogenetic analysis.

   (i) What is meant by the term 'DNA sequence'?

   (j) What are the primary objectives in establishing gene bank?

   (k) What is open reading frame?

   (l) What is ENTREZ?

   (m) Write a tool to generate DNA sequence.

Group - B

2. Write short notes on ***any four*** of the following : 5×4

   (a) BLAST

   (b) FASTA

   (c) Proteomics

   (d) Global Alignment

   (e) Transcriptomics

   (f) Gene Bank.

Please Turn Over

Group - C

3. Answer *any four* questions :

(a) What is the difference between bioinformatics and computational biology? What is the PDB code? What do you mean by specificity and sensitivity in BLAST? 4+3+3

(b) How methylated DNA is detected? What are the processes that involve heterochromatization? Give an account of epigenome. 3+3+4

(c) How does a gene prediction system work? How does a 3D protein prediction system work? How is DNA-Protein interaction studied? 4+3+3

(d) How a drug is designed? What are the methods of identifying a novel protein? Write down the applications of drug designing in medical science. 2+4+4

(e) What are the three major components of bioinformatics? What is the difference between structural and functional genomics? Give an account of microRNA and its uses. 3+3+4

(f) What is microarray? How is a transcriptome database created? What are the basic bioinformatic operations involving transcriptomics? 2+4+4

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