Total number of printed pages–4

3 (Sem–5/CBCS) ZOO HE 1

2023

ZOOLOGY

(Honours Elective)

Paper : ZOO–HE–5016

(Computational Biology and Biostatistics)

Full Marks : 60

Time : Three hours

The figures in the margin indicate full marks for the questions.

1. Fill in the blanks : 1×7=7

   (a) Gold biotechnology is also known as ________.

   (b) DDBJ is a__________sequence database.

   (c) ________ is a computer-annotated protein sequence database.

   (d) The information retrieval tool of NCBI GenBank is ________.

   (e) Proteomics refers to the study of ________.

Contd.

(f) _______ has been referred to as the mother and father of Bioinformatics.

(g) The identification of drugs through the genomic study is called _______.

2. Answer the following : 2×4=8

(a) Write the differences between local alignment and global alignment.

(b) Write about the different branches of bioinformatics.

(c) What is systems biology ?

(d) Write about the ddNTP structure and its use.

3. Answer the following questions : ***(any three)*** 5×3=15

(a) Describe the different sequence submission tools available at NCBI.

(b) Describe the Sanger's di-deoxy method of DNA sequencing.

(c) Briefly explain essential aspects of primary and secondary database.

(d) Write the differences between PAM and BLOSUM matrices.

(e) Explain co-efficient of variance and its importance.

Answer the following questions : 10×3=30

4. (a) Describe the scope and applications of bioinformatics in frontier areas of biology.

OR

(b) What is phylogeny ? Discuss the various methods of phylogenetic analysis.

5. (a) Describe various types of BLAST with their applications. Briefly explain the algorithm of BLAST.

OR

(b) What is sequence alignment ? Explain the various parameters used for optimum sequence alignment.

6. (a) How can you predict the structure of protein sequence ? Explain in detail one of the knowledge-based method to predict the protein structure.

OR

(b) Calculate the standard deviation and standard error from the following data :

$X:$	10 – 20	20 – 30	30 – 40	40 – 50	50 – 60	60 – 70	70 – 80
$Y:$	4	6	10	18	15	12	5
