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3 (Sem-5/CBCS) ZOO HE 1

2024

**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 : **(all seven)** 1×7=7
  - (a) RDBMS stands for \_\_\_\_\_.
  - (b) GenBank is a \_\_\_\_\_ sequence database.
  - (c) \_\_\_\_\_ is regarded as father of Biostatistics.
  - (d) The information retrieval tool of NCBI GenBank is \_\_\_\_\_.
  - (e) Genomics refers to the study of \_\_\_\_\_.

Contd.



- (f) DNA microarray is a technique to study \_\_\_\_\_.
- (g) Edman degradation is the method of sequencing \_\_\_\_\_.

2. Answer the following questions :  $2 \times 4 = 8$

- (a) Write the differences between primary database and secondary database.
- (b) What is FASTA format ? Give an example of nucleotide sequence in FASTA format.
- (c) What is Pharmacogenomics ?
- (d) Write the applications of Chi-square tests.

3. Answer the following questions : **(any three)**  
 $5 \times 3 = 15$

- (a) Briefly describe the different branches of Genomics.
- (b) Describe the chain termination method of DNA sequencing.
- (c) Briefly explain essential aspects of local and global sequence alignment.
- (d) Write the similarities and differences between BLAST and FASTA.

- (e) Explain the methods of optimizing sequence alignments.

4. Answer the following questions :  $10 \times 3 = 30$

- (a) Describe the role of a bioinformatician in present biological research and development area.

**OR**

What are the different components of a phylogenetic tree ? Describe the different methods of molecular phylogenetic analysis.  $3+7=10$

- (b) What is BLAST ? Describe the different variants of BLAST.  $2+8=10$

**OR**

Describe the major categories of biological database with examples.

- (c) Describe the different methods of protein tertiary structure prediction.

**OR**

Calculate the standard deviation and standard error from the following data :

X:	20-30	30-40	40-50	50-60	60-70	70-80	80-90
Y:	26	70	65	58	15	45	30