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3 (Sem-5/CBCS) ZOO HE 1

2021

(Held in 2022)

**ZOOLOGY**

(Honours Elective)

Paper : ZOO-HE-5016

**DSE(H) -1**

**(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) Multiple sequence alignment is an extension of \_\_\_\_\_ alignment.
- (b) FASTA format is also termed as \_\_\_\_\_ format.
- (c) Exon contains a part of the \_\_\_\_\_ that codes for a specific sequence.

Contd.

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- (d) DDBJ is maintained by \_\_\_\_\_.
- (e) \_\_\_\_\_ is a database for domains and protein families.
- (f) The fundamental statistical indicators are \_\_\_\_\_.
- (g) Standard deviation is the square root of \_\_\_\_\_.

2. Answer the following questions : **(any four)**  
2×4=8

- (a) State the differences between global and local alignment.
- (b) List *any two* protein databases.
- (c) Write the salient features of Genetic Code.
- (d) What is the difference between structural and functional genomics ?
- (e) What are primary databases ?
- (f) What is e-value of alignment scores ?
- (g) What is biostatistics ?
- (h) What is standard error ?

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

- (a) Compare PAM and BLOSUM matrices.
- (b) What do you mean by secondary database ? What are the major secondary databases ?
- (c) Illustrate global alignment with suitable example.
- (d) What is PIR ? Describe various resources and databases of PIR.
- (e) Define Chi-square test for goodness-of-fit. Mention the criteria for which Chi-square goodness-of-fit test is appropriate.

4. Answer the following : (**any three**)  
10×3=30

- (a) What is bioinformatics ? What are the branches, scope and aim of bioinformatics ?
- (b) Classify biological databases based on data type, maintainer status, data access, data source, database design and organism. Explain with proper examples.

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- (c) What is Entrez ? Systematically represent the architecture of Entrez system, briefly explaining each of them.
- (d) What is  $t$ -test ? How does one-sample  $t$ -test differ from two-sample  $t$ -test ?
- (e) The following table shows the distribution of the number of hours worked each month (on average) for a sample of 500 community college students.

Hours worked per month	Number of students
20 – 30	30
30 – 40	58
40 – 50	62
50 – 60	85
60 – 70	112
70 – 80	70
80 – 90	57
90 – 100	26

Find out the standard deviation.