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.

(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) Comapre 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.

(c) What is Entrez ? Systematically represent the architechture 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.
