

B.Sc. Sem.-5 Examination

SE-305

Biotechnology

April-2025

[Max. Marks : 70]

Time : 2-30 Hours]

Question 1: What is standard deviation? What are the steps involved to calculate the standard deviation. For example, blood serum cholesterol levels of 10 persons are as under: 240, 260, 290, 245, 255, 288, 272, 263, 277, 251. Calculate standard deviation for the above-mentioned data.

(14 Marks)

OR

Question 1(A): What is Median? What is the median of the following data set? (7 Marks)

32, 6, 21, 10, 8, 11, 12, 36, 17, 16, 15, 18, 40, 24, 21, 23, 24, 24, 29, 16, 32, 31, 10, 30, 35, 32, 18, 39, 12, 20

Question 1(B): Consider the following frequency distribution. Calculate the mean weight of students. (7 Marks)

| | | | | | | | | | |
|----------------|-------|-------|-------|-------|-------|-------|-------|-------|-------|
| Weight (in kg) | 31-35 | 36-40 | 41-45 | 46-50 | 51-55 | 56-60 | 61-65 | 66-70 | 71-74 |
| Weight (in kg) | 6 | 8 | 16 | 4 | 4 | 3 | 6 | 2 | 1 |

Question 2: Explain in detail about various types of Databases used in Bioinformatics. (14 Marks)

OR

Question 2(A): Write different applications of Bioinformatics. (7 Marks)

Question 2(B): What is Bioinformatics? Write a note on areas covered by Bioinformatics. (7 Marks)

Question 3: What is a phylogenetic tree, and what are the steps involved in its construction using MEGA software? (14 Marks)

OR

Question 3(A): Write a note on BLAST. (7 Marks)

Question 3(B): Write a note on PAM and BLOSUM matrix. (7 Marks)

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Question 4: Explain how genomics has led to revolution in many fields? Describe its role in metagenomics. (14 Marks)

OR

Question 4(A): Discuss the concept of personalized medicine, including its significance in modern healthcare. (7 Marks)

Question 4(B): Describe comparative genomic and functional genomics in detail. (7 Marks)

Question 5: Attempt any seven questions (2 Mark each) (14 Marks)

1. What is the mode in statistics?
 2. Find the mean of the first 10 even integers.
 3. What are the 3 central tendencies?
 4. What is Bioinformatics?
 5. Write the full form of "https" and "www".
 6. Write the full form of NCBI. Where is the location of the headquarters of NCBI?
 7. What is PAM scoring matrix?
 8. What is BLOSUM scoring matrix?
 9. What is ClustalW?
 10. What is the difference between pharmacogenomics and toxicogenomics?
 11. What is the concept of nutrigenomics?
 12. The study of chromosomal structure and architecture is known as _____.
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