

**B.Sc. BIOTECHNOLOGY
FIFTH SEMESTER
BIOINFORMATICS & BIostatISTICS
BBT-504**

**SET
A**

[USE OMR SHEET FOR OBJECTIVE PART]

Duration: 3 hrs.

Full Marks: 70

Time: 30 mins.

(Objective)

Marks: 20

Choose the correct answer from the following:

1×20=20

- Full form of NCBI is:
 - National Center for Bioinformatics Information
 - National Center for Biological Information
 - National Center for Biotechnology Information
 - None of the above
- Tandem repeats of almost 10 - 15 base pairs are called:
 - Microsatellite
 - Minisatellites
 - VNTR
 - Both b and c
- Which of the following database is of short sequence pattern and profile of protein?
 - PROSITE
 - iProclass
 - PDB
 - Pfam
- Which regions of a gene are not translated?
 - UTR
 - Intron
 - Both
 - None
- Protein databases can be searched at:
 - SRS
 - Entrez
 - Expasy
 - NCBI
- Which one of the following is a protein motif?
 - Alpha helix
 - Loop
 - Zn finger
 - Turn
- Which tool is for aligning translated nucleic acid 1 with translated nucleic acid 2?
 - tblastx
 - tblastn
 - Phi blast
 - All
- Which of the following is a molecular structure database?
 - PDB
 - MSD
 - Both
 - None
- Which of the peptides will be most deflected by magnetic field in mass spectrometry?
 - 120 KDA
 - 350 KDA
 - 1256 KDA
 - 100 KDA
- Global query is a feature of:
 - Entrez
 - SRS
 - Both
 - None

11. Secondary data are:
 - a. Fresh and raw data
 - b. Non-organized data
 - c. Organized data
 - d. Neither a nor b
12. Which of the following measures is graphically determined?
 - a. Median
 - b. Mean
 - c. Standard deviation
 - d. None of the above
13. _____ is the best measure of dispersion?
 - a. Mean
 - b. Standard deviation
 - c. Mean deviation
 - d. None of the above
14. If Mean = 4, Median = 7, then Mode = ?
 - a. 2
 - b. 9
 - c. 13
 - d. None of the above
15. In a Binomial distribution, the number of independent trials is 10, the probability of a success is 0.2, the mean is:
 - a. 2
 - b. 4
 - c. 0
 - d. None of the above
16. The number of people died due to rare disease, is an example of:
 - a. Binomial distribution
 - b. Poisson distribution
 - c. Normal distribution
 - d. None of the above
17. Degree of freedom is associated with:
 - a. t test
 - b. Chi-square test
 - c. F test
 - d. Z test
18. If the calculated value of the test statistic is greater than its critical value, then:
 - a. The null hypothesis is not rejected
 - b. The null hypothesis is rejected
 - c. No conclusion
 - d. None of the above
19. The two variables X and Y are independent, the correlation coefficient between X and Y is:
 - a. +1
 - b. -1
 - c. ± 1
 - d. 0
20. The product of two regression coefficients, is:
 - a. Less than or equal to 1
 - b. Greater than or equal to 1
 - c. Equal to 1
 - d. None of the above

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(Descriptive)

Time : 2 hr. 30 mins.

Marks : 50

[Answer question no.1 & any four (4) from the rest]

1. Write a note on Phylogenetic analysis. 10
2. a) Differentiate between pairwise and multiple sequence alignment. 5
b) Create PAM alignment for the following protein sequence: 5
PQFPW
AYLID
3. a) Substantiate with 5 points how can 2D gel electrophoresis separate 2 proteins of same molecular mass over SDS PAGE. 5
b) What do you understand by protein structure database? Elaborate. 5
4. a) What is sequence homology? What is the significance of accession no in genbank format? 5
b) Differentiate between motif and domain and compare Entrez and SRS. 5
5. a) What are the advanced characters of eukaryotic genome over prokaryotic genome? Compare the genetic markers and state which is the most advantageous citing the reason. 6
b) Differentiate between maximum parsimony and minimum likelihood. 4
6. Find mean, median, mode, standard deviation and coefficient of variation for the following distribution: 10
Class : 10 - 20 20 - 30 30 - 40 40 - 50 50 - 60
Frequency: 5 8 12 16 18
7. a) Write the properties of Poisson distribution. 4
b) If the probability of infection of COVID 19 is 20% in a certain place, what is the probability that out of 10 randomly selected people in the same place 6
(i) Two are infected
(ii) At least three are infected
8. a) Distinguish between correlation and regression. 4
b) To test the efficiency of a new drug a controlled experiment was conducted wherein 300 patients were administered the new drug and 200 other patients were not given the drug. The patients were monitored and results were obtained as follows: 6

	Cured	Condition worsened	No effect	
Given the drug	200	40	60	
Not given the drug	120	30	50	
[Given, $\chi^2_{0.05} =$		3.84	5.99	7.8
d.f. =	1	2	3]	

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