2022/12

SET B

B.Sc. MICROBIOLOGY
FIFTH SEMESTER
BIOINFORMATICS
BMB-503

[USE OMR SHEET FOR OBJECTIVE PART]

Duration: 3 hrs. **Full Marks: 70**

Objective

Time: 30 mins. **Marks: 20**

Choose the correct answer from the following: ***1×20=20***

1. If you are interested in running clustal x for your project purpose, which file format will you need?
   a. FASTA b. Flat file
   c. GCC d. Relational file

2. Which is not a heuristic method of alignment?
   a. blast b. fasta
   c. MSA d. All

3. Which softwares are used for drug designing?
   a. CADD b. QSAR
   c. SAR d. All

4. Which file format can be used in ENSEMBLE?
   a. FASTA b. GENBANK
   c. Both d. None

5. The most important technique of proteomics study is:
   a. 2D gel b. Mass spectrometry
   c. Protein sequencing d. All

6. Which of the following measures is affected by the extreme values?
   a. Median b. Mode
   c. Mean d. None of the above

7. The best measure of central tendency is.....
   a. Standard deviation b. Mean deviation
   c. Coefficient of variation (CV) d. Mean

8. The number of heads obtained in tossing of six unbiased coins, is an example of:
   a. Binomial distribution b. Poisson distribution
   c. Normal distribution d. None of the above

9. If the calculated value of the test statistic is less 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

10. If one of the regression coefficient is negative, the correlation coefficient is:
    a. Positive b. Negative
    c. Zero d. None of the above

11. Which BLAST program aligns translated nucleic acid query against translated nucleic acid database?
    a. tblastn
    b. tblastx
    c. blastx
    d. xblastt

12. Which of the following sequence retrieval system can be easily customised?
    a. Entrez
    b. SRS
    c. Both
    d. None

13. Which type of alignment is allowed in BLAST?
    a. Local
    b. Global
    c. Both
    d. None

14. Which of the following branch of bioinformatics is used to study human disease?
    a. Pharmacogenomics
    b. Functional genomics
    c. Both
    d. None

15. NCBI is maintained by:
    a. NIH
    b. NLM
    c. Both NIH and NLM
    d. NCBI

16. Primary data are:
    a. Fresh and raw data
    b. Organized statistically
    c. Both a and b
    d. Neither a nor b

17. .....is the best relative measure of dispersion.
    a. Mean
    b. Coefficient of variation
    c. Standard deviation
    d. None of the above

18. In a Poisson distribution with mean 4, the standard deviation is:
    a. 2
    b. 4
    c. 0
    d. None of the above

19. Degree of freedom is associated with:
    a. t test
    b. Chi-square test
    c. F test
    d. All of the above

20. The two variables X and Y are linearly related, the correlation coefficient between X and Y is:
    a. +1
    b. -1
    c. ±1
    d. 0

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Descriptive

Time : 2 hr. 30 mins. Marks : 50

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

1. Explain GENBANK. Write a note on NCBI. 10

2. What is PCR technique? Explain different types of PCR. 10

3. a) Differentiate between pairwise and multiple sequence alignment. 5
   b) Describe the steps involved in performing BLAST. 5

4. What do you understand by protein structure database? Elaborate with example. 10

5. 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

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 binomial distribution. 4
   b) If the heights of 500 students are normally distributed with mean 68.0 inches and standard deviation 3.0 inches, how many students have height between 65 and 71 inches? 6

8. a) Define positive, negative and zero correlation. 4
   b) A certain drug was administered to 456 patients out of a total of 720 in a certain locality to test its efficiency against COVID-19. The incidence of COVID-19 is shown below. Find out the effectiveness of the drug of against the disease. (The table value of x^2 for 1 degree of freedom at 5% level of significance is 3.84). 6

	Infection	No infection
Administering the drug	: 144	312
Without administering the drug	: 192	72

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