Seat No. : _____

NF-130

November-2021

B.Sc., Sem.-V

305 : Biotechnology

(Computational Biology)

(New)

Time : 2 Hours] **[Max. Marks : 50**

Instructions : (1) Draw figures wherever necessary.
(2) Write question number against each answer.
(3) Answer any **three** out of initial eight main questions. Question **– 9** is **compulsory**.

Section – I

1. (A) Explain in brief about measures of central tendency. **7**

   (B) A proof-reads through 73 pages manuscript. The number of mistakes found on each of the pages are summarized in the table below. Determine the mean number of mistakes found per page. **7**

No. of mistakes	1	2	3	4	5	6	7
No. of pages	5	9	12	17	14	10	6

2. (A) Give a brief account of Normal distribution. **7**

   (B) The number of out patients visited hospital each day of a week are 13, 8, 4, 9, 7, 12, 10. Find its standard deviation. **7**

3. (A) Describe nucleotide databases and its importance. **7**

   (B) Write about applications of bioinformatics. **7**

4. (A) Discuss different retrieval systems from biological databases . **7**

   (B) Write about Swissprot and PDB databases. **7**

5. (A) Explain Dot matrix, PAM & BLOSUM matrices. **7**

   (B) Write about algorithm of BLAST program. **7**

6. (A) What is MSA ? Write about steps of ClustalW. **7**

   (B) Explain in brief about methods of prediction of phylogenetic trees. **7**

7. (A) Discuss Toxigenomics and its applications. **7**

(B) What is SNP ? How is it used in personalized medicine ? **7**

8. (A) Describe in detail about types of Genomics. **7**

(B) Explain different applications of Genomics. **7**

Section – II

9. Answer any **eight** of the following : **8**

(1) Expand NCBI.

(2) Calculate range of the given data set :

2, 10, 21, 38.37, 23, 38

(3) Find the mode for the following list of values :

13, 18, 13, 14, 13, 16, 14, 21, 13

(4) What is Variance ?

(5) What is Gaussian distribution ?

(6) Write the importance of sequence alignment.

(7) Draw unrooted tree.

(8) Expand UPGMA.

(9) The laboratory work using computers and associated with web-based analysis generally online is referred to as _____.

(10) What are homologous sequences ?

(11) Give an example of secondary database.

(12) Each record in a database is called an _____.

(13) What is SRS ?

(14) Write two applications of bioinformatics.

(15) What is gap penalty ?

(16) DNA sequencing followed by genome annotation are steps of _____.

(17) What are the features considered for comparison of genomes ?

(18) _____ is most frequently occurring variation in human genome.

(19) What is metagenomics ?

(20) What is the cytochrome P450 system ?

_____

Seat No. : _____

NF-130

November-2021

B.Sc., Sem.-V

305 : Biotechnology

(Life in Extremophiles)

(Old)

Time : 2 Hours] **[Max. Marks : 50**

Instructions : (1) Draw figures wherever necessary.
(2) Write question number against each answer.
(3) Answer any **three** out of initial eight main questions. Question **– 9** is **compulsory**.

Section – I

1.	(A)	Write the laws of minimum and tolerance.	**7**
	(B)	Discuss unique features and chemical composition of extremophiles.	**7**
2.	(A)	Give a brief account of extremophiles in pressure and osmotic condition.	**7**
	(B)	Explain in brief about mechanism of molecular chaperons.	**7**
3.	(A)	Describe molecular adaptations of thermophiles.	**7**
	(B)	Discuss biotechnological applications of thermophiles.	**7**
4.	(A)	Discuss environment conditions suitable for growth of thermophiles.	**7**
	(B)	Write about important sites and ecological parameters of thermophiles.	**7**
5.	(A)	Discuss cellular adaptations of halophiles to their environment.	**7**
	(B)	Write about habitat and important sites of halophiles.	**7**
6.	(A)	Explain in brief about types of halophiles with examples.	**7**
	(B)	Write about applications of halophiles.	**7**
7.	(A)	Write characteristics of radio tolerant and barophiles with examples	**7**
	(B)	Differentiate alkalophiles and acidophiles.	**7**
8.	(A)	Explain adaptations of xerophiles and oligotrops.	**7**
	(B)	Write biotechnological applications of extremophiles.	**7**

Section – II

9. Answer any **eight** of the following : **8**

(1) What is active transport ?

(2) Which amino acids are largely present in the cell membrane of the halophilic bacteria ?

(3) What is the full form of PGP - Me ?

(4) Name the carotenoid pigment present in halophiles.

(5) Give an example of halophilic algae which is widely used for biofuel generation.

(6) What DNA adaptation do thermophiles exhibit ?

(7) What is another name of barophiles ?

(8) Anhydrobiosis is an adaptation mechanism for _____.

(9) What is the temperature in hydrothermal vents ?

(10) Give an example of alkalophile.

(11) What is white smoker ?

(12) What is homeostatis ?

(13) Antifreeze proteins or AFPs enable organisms that possess it to survive _____.

(14) Write examples of extremophiles.

(15) What is mesophile ?

(16) Name the scientist who proposed "Law of tolerance".

(17) Oligotrophs are mostly found in environments lacking _____.

(18) The presence of the DNA repair enzyme- Rec A protein is an adaptation mechanism for _____.

(19) Most thermophiles belong to the _____ Domain.

(20) Write the single concentration of hot springs and geothermal vents.

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