Roll No											

PRESIDENCY UNIVERSITY
BENGALURU

SCHOOL OF ENGINEERING
MID TERM EXAMINATION - OCT 2023

Semester : Semester V - 2021
Course Code : CSE3069
Course Name : Sem V - CSE3069 - Introduction to Bioinformatics
Program : B. TECH

Date : 2-NOV-2023
Time : 9:30AM - 11:00AM
Max Marks : 50
Weightage : 25%

Instructions:
(i) Read all questions carefully and answer accordingly.
(ii) Question paper consists of 3 parts.
(iii) Scientific and non-programmable calculator are permitted.
(iv) Do not write any information on the question paper other than Roll Number.

PART A

ANSWER ALL THE QUESTIONS **(10 X 1 = 10M)**

1. Proteomics refers to the study of:
a. Set of proteins in a specific region of the cell
b. Biomolecules
c. Set of proteins
d. The entire set of expressed proteins in the cell

(CO1) [Knowledge]

2. Which tool is best suited for finding Locus Specific Mutations?
a. Sequence Retrieval Systems
b. Entrez
c. Sequence Tagged Site
d. Expressed Sequence Tags

(CO1) [Knowledge]

3. The identification of drugs through the genomic study is called_____.
a, Genomics
b. Pharmacogenomics
c. Pharmacogenetics
d. Metobolomics

(CO1) [Knowledge]

4. Analysing or comparing the entire genome of spices is called? (CO1, Knowledge)
a. Bioinformatics
b. Genomics
c. Protieomics
d. Genetics

(CO1) [Knowledge]

5. DNA and RNA are examples of which FAMILY of BIOLOGICAL MOLECULES?
a. Protiens
b. Carbohydrates
c. Lipids
d. Nucleic Acid

(CO1) [Knowledge]

6. FASTA format starts with _____ symbol. (CO2, Knowledge)
a. / (Backslash)
b. * (Asteric)
c. @ (At Symbol)
d. > (Greater than symbol)

(CO2) [Knowledge]

7. Identification of genes and their respective functions are called _____
a. Functional Genomics
b. Structural Genemoics
c. Comparative Genemics
d. None of the above

(CO2) [Knowledge]

8. Entrez, a life science search engine used to search across databases is maintained by _____.
a. Swiss prot
b. EMBL
c. DDBJ
d. NCBI

(CO2) [Knowledge]

9. Which of the following is a primary function of carbohydrates?
a. Storing genetic information
b. Providing short-term energy storage
c. Acting as a long-term energy source
d. Speeding up chemical reactions

(CO2) [Knowledge]

10. PIR was established by _____.
a. NBRF
b. NCBI
c. SIB
d. DDBJ

(CO2) [Knowledge]

PART B

ANSWER ALL THE QUESTIONS **(2 X 10 = 20M)**

11. A. Bioinformatics has variety of application fields. Explain any 5 fields of application in detail. (5Marks)

B. Ankit wants to study the types of databases associated with bioinformatics. Explain the types with examples. (5 Marks)

(CO1) [Comprehension]

12. Describe the following in detail
(i) Global and Local Alignments with examples. (5 Marks)

(ii) FASTQ & FASTA with examples. (5 Marks)

(CO2) [Comprehension]

PART C

ANSWER THE FOLLOWING QUESTION **(1 X 20 = 20M)**

13. A. Reconstruct the sequence using the below given k-mers. (10 Marks)
'CATC', 'CAAG', 'CCAA', 'TCCA', 'AGGT', 'CGAT', 'GTAC', 'TACG', 'ACGA', 'CGAT', 'GATC', 'ATCG', 'ATCG', 'TCGA', 'GATC', 'AAGG', 'TCGG', 'CGGA', 'GGAT', 'GGTA', 'GATC', 'ATCA', 'TCAG', 'CAGC', 'AGCA', 'GCAT', 'TCCA', 'ATCC'

B. Calculate the alignment Score for the given Sequences S1 & S2 using the below Substitution matrix by ignoring the gap penalties. (10 Marks)

Substitution Matrix				
	T	A	C	G
T	4			
A	-2	3		
C	-3	-2	4	
G	-1	-4	-1	5

S1 = CGTAG-ATAG-TGCTAG-AGAAT-GGG-CCACT
S2 = GTAGCTGATG-ATCGATCGTACGTAGC-GCTGA

(CO2) [Application]