STELLA MARIS COLLEGE (AUTONOMOUS) CHENNAI 600 086
(For candidates admitted from the academic year 2023 – 2024)

M. Sc. DEGREE EXAMINATION, NOVEMBER 2024
BIOINFORMATICS
THIRD SEMESTER

COURSE : CORE
PAPER : PROTEOMICS AND METABOLOMICS
SUBJECT CODE : 23BI/PC/PM34
TIME : 3 HOURS **MAX. MARKS: 50**

Q. NO.	SECTION A ANSWER ALL QUESTIONS. (10 X1=10)	CO	KL
1.	The term Proteome was coined by____.	CO1	K1
2.	_____is the study of complete complement of all small molecule metabolites found in a specific cell, organ or organism.	CO2	K2
3.	____ and ____ are metabolic databases.	CO1	K1
4.	**True or False** The goal of proteomics is to gain a comprehensive understanding of proteins in a cell, tissue, or organism, and how they change.	CO2	K2
5.	**True or False** Preparative IEF is an electrophoretic technique for the separation of amphoteric analytes according to their mass to charge ratio by the application of an electric field along a pH gradient	CO1	K1
6.	FREAD and CODA are specialized programs used for ____.	CO2	K2
7.	Rampage is a _____ tool. a. Homology modeling b. Loop modeling c. validation d. secondary structure prediction	CO1	K1
8.	_____ states that protein native structure corresponds to the state with lowest free energy of the protein solvent system.	CO2	K2
9.	**True or False** One domain may have many motifs.	CO1	K1
10.	Rosetta is an algorithm for _____ method.	CO2	K2
Q. No.	**SECTION B** **ANSWER IN ABOUT 50 WORDS. (10 X2=20)**	**CO**	**KL**
11.	List any two advanced features of Alphafold3.	CO3	K3
12.	Mention any four tools used for protein structural visualization.	CO3	K3
13.	Differentiate between targeted and untargeted metabolomics.	CO4	K4
14.	Define paleo-proteomics.	CO4	K4
15.	What is the principle of yeast-two hybrid system.	CO3	K3

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16.	Illustrate a study design using STRING, Cytoscape and KEGG.	CO4	K4
17.	What are chaperonins?	CO4	K4
18.	List the significance of Astrobiology.	CO3	K3
19.	What is SwissParam used for?	CO3	K3
20.	Differentiate between univariate and multivariate metabolomics analysis.	CO4	K4
Q. No.	**SECTION C** **ANSWER IN ABOUT 600 QUESTIONS (4X5=20)**	**CO**	**KL**
21. a)	Compare and analyze the advantages and limitations of top down and bottom up approaches in proteomics. **(OR)**	CO5	K5
b)	Write an overview of proteogenomics. List down its applications.		
22. a)	Explain in detail about various steps involved in proteomic data analysis. **(OR)**	CO5	K5
b)	What role does proteomics play in the discovery of biomarkers and personalized medicine.		
23. a)	Elaborate on the recent trends in Glycomics and Lipidomics. **(OR)**	CO5	K6
b)	Explain in detail about protein misfolding and its effects in diseases. Add note on the significance of chaperone-based disease corrections.		
24.a)	Explain in detail about various steps involved in Protein Crystallography. **(OR)**	CO5	K6
b)	Illustrate the various steps involved in the statistical analysis of metabolomics.		

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