22BTP102N/ 22BTP102

PSG COLLEGE OF ARTS & SCIENCE
(AUTONOMOUS)

MSc DEGREE EXAMINATION MAY 2024
(First Semester)

Branch - **BIOTECHNOLOGY**

STRUCTURAL BIOLOGY AND CHEMISTRY OF PROTEINS

Time: Three Hours Maximum: 75 Marks

SECTION-A (10 Marks)

Answer **ALL** questions

ALL questions carry **EQUAL** marks (10 × 1 = 10)

Module No.	Question No.	Question	K Level	CO
1	1	What are the most common regular secondary structures found in proteins? a) Alpha-helix and turns b) Beta-sheets and loops c) Loops and turns d) Alpha-helix and beta-sheets	K1	CO1
	2	Infer the structural classification of proteins (based on motifs) is based primarily on their: a) Amino acid sequence b) Evolutionary relationships. c) Function. d) Secondary structure content and arrangement.	K2	CO1
2	3	Which among the following motifs contain a positively charged ion? a) Leucine zippers b) H-T-H motif c) Homeobox d) Zinc fingers	K1	CO2
	4	Show in the zinc finger, which residues in this sequence motif form ligands to a zinc ion? a) Cysteine and histidine b) Cysteine and arginine c) Histidine and proline d) Histidine and arginine	K2	CO2
3	5	Which of the following is incorrect regarding 2D-Page? a) It stands for Two-dimensional polyacrylamide gel electrophoresis b) It separates proteins by charge only c) The gel is run in one direction in a pH gradient under a non-denaturing condition d) It works to separate proteins by isoelectric points (pI)	K1	CO3
	6	Explain which of the following detector is used for proteins in the X – ray crystallography? a) Scintillation counters b) Proportional counters c) Optical cameras d) CCD cameras	K2	CO3
4	7	Choose the odd one out with respect to DNA polymerase III. a) dna E b) dna N c) dna Q d) dna B	K1	CO4
	8	Explain which of the following is not the classified form of conjugated proteins? a) Lipoproteins b) Glycoproteins c) Metalloproteins d) Complete proteins	K2	CO4
5	9	Which of the following properties is improved by site directed mutagenesis? a) Physical property b) Chemical property c) Kinetic property d) Integrity	K1	CO5
	10	Show which of the following was constructed to reduce the immunogenicity of murine antibodies in humans? a) Monoclonal antibodies b) Anti-murine antibodies c) Anti-chimeric antibodies d) Chimeric antibodies	K2	CO5

Cont...

SECTION - B (35 Marks)

Answer **ALL** questions

ALL questions carry **EQUAL** Marks (5 × 7 = 35)

Module No.	Question No.	Question	K Level	CO
1	11.a.	Examine why the conformational freedom of peptide bonds is limited.	K4	CO1
		(OR)		
	11.b.	List out the types of beta sheets observed in protein and a note on features of beta sheet.		
2	12.a.	Infer the role of Zinc fingers of steroid receptors.	K4	CO2
		(OR)		
	12.b.	Analyze the structure of leucine zipper.		
3	13.a.	Explain mass spectrometry for protein identification.	K5	CO3
		(OR)		
	13.b.	Evaluate the method of chemical synthesis of protein.		
4	14.a.	Explain the structure and application of peptide.	K5	CO4
		(OR)		
	14.b.	Assess the importance of growth factors.		
5	15.a.	Elaborate the steps involved in engineering of cryostable enzymes.	K6	CO5
		(OR)		
	15.b.	Formulate the steps involved in combinatorial enzyme engineering.		

SECTION -C (30 Marks)

Answer **ANY THREE** questions

ALL questions carry **EQUAL** Marks (3 × 10 = 30)

Module No.	Question No.	Question	K Level	CO
1	16	Examine the tertiary structure of myoglobin detail.	K4	CO1
2	17	Analyses the structure of chaperones and chaperonins.	K4	CO2
3	18	Determine the role of Chromatography in protein purification with a suitable example.	K5	CO3
4	19	Support with evidence - DNA polymerase a multifunctional enzyme.	K5	CO4
5	20	Elaborate the method used to develop an engineered chimeric antibody.	K6	CO5

Z-Z-Z END