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22BTP102N

PSG COLLEGE OF ARTS & SCIENCE (AUTONOMOUS)

MSc DEGREE EXAMINATION MAY 2025

(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

 $(10 \times 1 = 10)$

| Module | Question | ALD questions carry EQUAL marks (10 | ×1=) | |
|--------|----------|--|------------|-------------|
| No. | No. | Question | K Level | CO |
| 1 | 1 | Peptide bond is formed between group a) CO and NH b) NH and OH c) OH and CO d) NH and NH | K1 | CO1 |
| | 2 | Structural motifs characterised by 4 Beta strands a) βα barrel b) β turns c) βbulge d) greek key | K2 | CO1 |
| 2 | 3 | The function of GAL 4 a) regulates transcription of genes in galactose metabolism b) inhibits transcription of genes in galactose metabolism c) regulates transcription of genes in lactose metabolism d) inhibits transcription of genes in lactose metabolism | K1 | CO2 |
| | 4 | In Zinc finger which residue in sequence motifs form ligands to a zinc ion a) Cystein and Histidine b) Cystein and Arginine c) Histidine and proline d) Histine and Arginine | K2 | CO2 |
| 3 | 5 | The method which involves the use of phenylisothiocyanate a) dideoxy method b)Edman method c) sangers method d) electrophoresis | K1 | CO3 |
| | 6 | An optical technique used to measure molecular interaction in a real time a) Surface plasmon interaction b)NMR c)X-ray Diffraction d) Mass spectroscopy | K2 | CO3 |
| 4 | 7 | Example for Metalloprotein a) collagen b) Haemoglobin c) Keratin d) albumin | K1 | CO4 |
| | 8 | Subtilisin are a) Proteolytic enzyme b) Lipolytic enzyme c) denatured enzyme d) glycolytic enzyme | K2 . | CO4 |
| 5 | 9 | What type of reactions occurs for the conversion of asparagine to aspartic acid? a) decarboxylation b) Hydroxylation c) desulfdration d) deamination | K1 | CO5 |
| | 10 | The step that is performed before site directed mutagenesis a) Gene Expression b) protein assay c) Knowledge based design of novel protein d) preparative Biochemistry | K2 | CO5 |

SECTION - B (35 Marks)

Answer ALL questions

| ALL questions carry EQUAL Marks $(5 \times 7 = 35)$ | | | | | | |
|---|-----------------|--|------------|-----|--|--|
| Module No. | Question No. | Question | K Level | CO | | |
| 1 | 11.a. | Illustrate the primary structure of proteins. | | | | |
| | (OR) | | K2 | CO1 | | |
| | 11.b. | Illustrate the structure of Myoglobin. | | | | |
| . 2 | 12.a. | Discuss in detail about the structural domains -Zinc finger motifs. | | CO2 | | |
| | | (OR) | K3 | | | |
| | 12.b. | Describe in detail about Membrane protein -Bacterio rhodopsin. | | | | |
| 3 | 13.a. | Enumerate the principle and application of 1D and 2D gel Electrophoresiss. | | CO3 | | |
| | | (OR) | K3 | | | |
| | 13.b. | Give the Instrumentation and application of X-ray Diffraction. | | | | |
| 4 | 14.a. | State the structure of Collagen triple helix. | | | | |
| | (OR) | | | CO4 | | |
| | 14.b. | Give an account on Biologically important peptides with examples. | | | | |
| 5 | 15.a. | How enzymes are engineered? | | | | |
| | (OR) | | K4 | CO5 | | |
| | 15.b. | How engineered biomaterials are made? | | | | |

SECTION -C (30 Marks) Answer ANY THREE questions

ALL questions carry EQUAL Marks

 $(3 \times 10 = 30)$

| Module No. | Question No. | Question | K Level | CO |
|---------------|-----------------|---|------------|-----|
| 1 | 16 | Describe about the secondary structure of proteins. | K2 | CO1 |
| 2 | 17 | List the forces governing protein structure. | К3 | CO2 |
| 3 | 18 | Elaborate the protein analysis using chromatography. | К3 | CO3 |
| 4 | 19 | What are Antimicrobial peptides? Explain its types and application. | K3 | CO4 |
| 5 | 20 | Explain about Combatorial enzyme engineering. | K4 | CO5 |