

PSG COLLEGE OF ARTS & SCIENCE
(AUTONOMOUS)

MSc DEGREE EXAMINATION DECEMBER 2022
(First Semester)

Branch – BIOTECHNOLOGY

STRUCTURAL BIOLOGY AND CHEMISTRY OF PROTEINS

Three Hours

Maximum: 50 Marks

SECTION-A (5 Marks)

Answer ALL questions

ALL questions carry EQUAL marks

(5 x 1 = 5)

1. Which of the following amino acid is most compatible with an α - helical structure?
(i) Tryptophan (ii) Alanine
(iii) Leucine (iv) Proline
2. In the zinc finger, _____ residues of sequence motif acts as ligand to zinc ion.
(i) Cysteine and histidine (ii) Cysteine and arginine
(iii) Histidine and proline (iv) Histidine and arginine
3. Which of the following techniques is used to determine the protein structures?
(i) Kryptonics X-ray vision (ii) X-ray crystallography
(iii) Magnetic resonance imaging (MRI) (iv) Spectroscopy
4. _____ is a peptide based antibiotic molecule.
(i) Erythromycin (ii) Gramicidin
(iii) Ciprofloxacin (iv) Tetracycline
5. Site directed mutagenesis on a DNA molecule can be done using _____.
(i) Chemical mutagens (ii) Physical mutagens
(iii) Synthetic oligos (iv) Random cleavage and ligation

SECTION - B (15 Marks)

Answer ALL Questions

ALL Questions Carry EQUAL Marks

(5 x 3 = 15)

- 6 a Explain the difference between D and L configuration of amino acids.
OR
b Interpret the conformation of β -pleated sheets in proteins.
- 7 a Analyse the structural motifs in leucine zipper domain.
OR
b Describe the secondary structure of bacteriorhodopsin.
- 8 a Illustrate the principle and technique of ion exchange chromatography.
OR
b Explain the principle of surface Plasmon resonance in protein analysis method.
- 9 a Describe the structure of tripeptide, in which glycine is one of the amino acid.
OR
b Interpret the structure and applications of serine protease.

Cont...

- 10 a Analyse the methods of production of protein engineered biomaterials.
OR
b Discuss the method of oligonucleotide directed mutagenesis.

SECTION -C (30 Marks)

Answer ALL questions

ALL questions carry EQUAL Marks

(5 x 6 = 30)

- 11 a Analyse the conformation of protein using Ramachandran plot.
OR
b Elucidate the super secondary structures of protein with suitable example.
- 12 a Discuss in detail the structural motifs of zinc fingers.
OR
b Elucidate the various forces that stabilize the structure of proteins.
- 13 a Analyze the separation of protein by 2-D gel electrophoresis.
OR
b Determine the structure of protein using NMR spectroscopy.
- 14 a Elucidate the structure and functions of antimicrobial peptides. Add a note on its applications.
OR
b Discuss in detail the structure and function of DNA polymerase.
- 15 a Interpret the methods of production of chimeric antibody.
OR
b Analyse the methods by which a protein can be engineered to enhance its properties.

Z-Z-Z END