

B.TECH. DEGREE EXAMINATIONS: APRIL / MAY 2010

Sixth Semester

BIOTECHNOLOGY

U07BT603: Protein Engineering

Time: Three Hours

Maximum Marks: 100

Answer ALL the Questions:-

PART A (10 x 1 = 10 Marks)

1. The forces that hold the nonpolar regions of the molecules together are called as _____
 - a. hydrophobic interactions
 - b. ionic bond
 - c. co-ordinate
 - d. van der Waals interaction
2. _____ can lyse / degrade bacterial cell wall and serve as bactericidal agent.
 - a. ribonuclease
 - b. lysozyme
 - c. lipase
 - d. decarboxylase
3. Pickout the iminoacid from the following
 - a. alanine
 - b. glycine
 - c. proline
 - d. valine
4. All the amino acids exhibits isomerism except one
 - a. alanine
 - b. glycine
 - c. proline
 - d. valine
5. _____ structure gives the spatial arrangement of proteins by twisting of the polypeptide chain
 - a. Secondary structure
 - b. primary structure
 - c. tertiary structure
 - d. quaternary structure
6. Which of the enzyme is not used to cleave the peptide bonds
 - a. elastase
 - b. trypsin
 - c. proteinase
 - d. phosphatase
7. _____ binds tightly to DNA at promoter of the structural genes ,preventing RNA polymerase from binding to DNA
 - a. Operator
 - b. enhancer
 - c. repressor
 - d. inhibitor
8. The TBP stands for
 - a. Transcription Binding protein
 - b. Translation Binding protein
 - c. Transduction Binding protein
 - d. TATA box Binding Proteins
9. T4 lysozyme consists of 2 Cysteine residues at _____ and _____.
 - a. Cys 54 & Cys 97
 - b. Cys 56 & Cys 98
 - c. Cys 45 & Cys 79
 - d. Cys 52 & Cys 97

10. Scaffolds of _____ proteins have similar structure
a. homologous b. heterologous c. dipeptide d. polypeptide

PART B (10 x 2 =20 Marks)

11. Define Protein Engineering.
12. Define coordinate interaction in native protein structure.
13. What is the action of UV rays on proteins?
14. Define Ampholytes.
15. Define pKa of amino acids.
16. Give the principle of Mass spectrometry.
17. How are proteins denatured?
18. What is the specificity of chymotrypsin?
19. What are the two important applications of 2D crystal structure in protein engineering?
20. Define Cro protein.

PART C (5 x 14 =70 Marks)

21. (a) Write notes on:
i) Covalent interactions in native protein (7)
ii) Elucidation of primary structure of a protein (7)

(OR)

- (b) Explain in detail about the interaction of electromagnetic radiations with proteins.

22. (a) Write Short notes on:
i) Molecular properties of amino acids. (7)
ii) Peptide synthesis. (7)

(OR)

- (b) Discuss in detail on post-translational modifications in a newly synthesized protein.

23. (a) Write Short notes on the following
i) Sequencing of peptides (7)
ii) Denaturation and renaturation of proteins (7)

(OR)

(b) Write notes on:

i) Super secondary structure of proteins (7)

ii) X-ray crystallography to determine 3D structure of proteins (7)

24. (a) i) Comment on bacteriorhodopsin (6)

ii) How is catalytic design studied through trypsin engineering (8)

(OR)

(b) Elaborate on Prokaryotic DNA binding proteins.

25. (a) Do you agree with the statement that Engineering the protein is a boon at an Industrial and research level ? If yes/ no justify your answer with a suitable example

(OR)

(b) Write a Short notes on:

(i) *de novo* synthesis of protein. (8)

ii) Advantages of protein engineering. (6)
