

Register Number:.....

**B.TECH., DEGREE EXAMINATIONS MAY/JUNE 2013**

Sixth Semester

**BIO TECHNOLOGY**

BTY119: Protein Engineering

**Time: Three Hours**

**Maximum Marks: 100**

**Answer ALL Questions:-**

**PART A (10x1=10 Marks)**

1. At low pH value an amino acid exists as -----  
(a) anion                      (b) cation                      (c) neutral in charge                      (d) zwitter ion
2. What type of light can be adsorbed by aromatic amino acid?  
(a) near UV                      (b) UV                      (c) IR                      (d) Visible
3. Peptide bonds can be cleaved by -----  
(a) 7N H<sub>2</sub>SO<sub>4</sub>                      (b) 4N NaOH                      (c) 6N HCL                      (d) 3N H<sub>2</sub>SO<sub>4</sub>
4. Alpha helical structure was proposed by  
(a) Pauling                      (b) Corey                      (c) Loery                      (d) Pauling & Corey
5. The number of peptide bonds present in a decapeptide is  
(a) 7                      (b) 8                      (c) 9                      (d) 10
6. Super secondary structure is known as  
(a) fold                      (b) Rossmann fold                      (c) Alpha domains                      (d) Subunits
7. Leucine zipper functions as a ----- domain  
(a) dimer                      (b) trimer                      (c) monomer                      (d) tetramer
8. Photosynthetic reaction centre is a complex of  
(a) Several proteins                      (b) pigments                      (c) cofactors                      (d) proteins, pigments, cofactors
9. Insulin consists of  
(a) 30 aminoacid polypeptide chain  
(b) 20 aminoacid polypeptide chain  
(c) 21 aminoacid polypeptide chain  
(d) 30 aminoacid polypeptide chain & 21 aminoacid polypeptide chain
10. HIV is a ----- .  
(a) slowly replicating retrovirus                      (b) fast replicating retrovirus  
(c) Undifferentiated cell                      (d) slowly replicating bacteria.

**PART B (10x2=20 Marks)**

11. Define Zwitter ion
12. Name the amino acids possessing additional chiral centers.
13. Give the stages of Edman degradation
14. Outline the advantages of mass spectrometry.
15. Write the importance of tertiary structure.
16. Write FEW characteristic features of  $\beta$  pleated sheet.
17. What is bacteriorhodopsin?
18. What is TATA box binding protein?
19. Define protein engineering.
20. What is a rational design? Quote an example.

**PART C (5x14=70 Marks)**

21. a) (i) Explain about Ramachandran plot. (4)  
(ii) Explain about post-translational modifications of proteins involving in amino groups. (10)  
**(OR)**  
b) Briefly explain on protein separation by 2 D gel electrophoresis.
22. a) Explain about MS and Edman degradation method for protein sequencing.  
**(OR)**  
b) (i) Write about Helix turn helix? (7)  
(ii) Give an account on Rossmann fold. (7)
23. a) (i) Explain in denaturation and renaturation of protein (7)  
(ii) Write about the technique involved in X-ray diffraction to determine protein structure. (7)  
**(OR)**  
b) Give a detailed account on  $\alpha/\beta$  domain with suitable examples.
24. a) (i) Write an account on general characteristics of membrane proteins. (5)  
(ii) How TATA BOX binding protein is involved in eukaryotic transcription. (9)  
**(OR)**

b) (i) Explain about structure of Immunoglobulins. (7)

(ii) Discuss in brief the structural characteristics of trp-repressor protein. (7)

25. a) How recombinant Insulin aggregation was prevented through protein engineering?

**(OR)**

b) Write short notes on:

(i) Protein Engineering for Thermostable Lysozyme (7)

(ii) Protein Engineering for prevention of HIV entry into host. (7)

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