A 321

B.E./B.Tech. DEGREE EXAMINATION, NOVEMBER/DECEMBER 2005.

Seventh Semester

Industrial Biotechnology

IB 433 — PROTEIN ENGINEERING

Time : Three hours Maximum : 100 marks

Answer ALL questions.

PART A — (10 × 2 = 20 marks)

1. Explain the specificity of Trypsin and chymotrypsin on other proteins.

2. Why are loop regions at the surface of protein molecules?

3. Explain the major and minor groove of DNA in its interaction with DNA binding protein.

4. Differentiate against from hormone.

5. Name any two potent inhibitors of serine proteases what is their role in biology.

6. What do you understand on lysozyme enzyme specificity?

7. Compare FAD and NAD binding domains of protein.

8. Transmembrane alpha helices are part of bacteriorhodopsin. Why.

9. How tertiary fold of an enzyme is predicted?

10. Engineering mutations in the substrate specificity pocket facilitates altered catalysis – How?

PART B — (5 × 16 = 80 marks)

11. (i) Name any four different post translational protein modifiation phenomena. (4)

(ii) Explain any three such modification and their biological consequences. (12)

12. (a) Differentiate the peptide bond from amide bond. Explain the significance of phi and psi angles in a protein.

Or

(b) Why some amino acids are preferred in alpha helices of protein? The alpha helix has macrodipole moment – Comment.

13. (a) Explain lambda "cro" and "repressor proteins" is having a specific DNA binding motif. Comment on their biological significance.

Or

(b) V_L, V_H of IgG are equivalent to an active site of an enzyme–substantiate the claim with suitable example.

14. (a) Leucine zippers provide dimerization interactions for eukaryotic DNA–binding protein – Explain.

Or

(b) How the processivity and fidelity of DNA synthesis is achieved by DNA polymerase?

15. (a) How proteins can be made stable by engineering? Explain with suitable examples.

Or

(b) Site directed Mutagenesis – In what way, it is relevant in understanding the function of proteins. Explain with specific example.
