Register Number: ……

B.TECH DEGREE EXAMINATIONS: APRIL/MAY 2012

Fourth Semester

BIOTECHNOLOGY

BTY108: Bioorganic Chemistry

Time: Three Hours **Maximum Marks: 100**

Answer ALL questions:-

PART A (10 x 1 = 10 Marks)

1. What is the pH of a 0.00001 molar HNO_3 solution

   (a) 4 (b) 5 (c) 9 (d) 1

2. A buffer is a mixture of

   (a) weak salt and its double salt (b) weak ion and its salt

   (c) weak base and acid (d) strong base and weak base

3. Higher the Km _____ the affinity of substrate for the enzyme

   (a) higher (b) same (c) lower (d) activated

4. Spontanous reactions have a net _____ free energy change

   (a) positive (b) increases (c) decreased (d) negative

5. _____ is a reactant in Strecker's synthesis of amino acids

   (a) aldehyde (b) alcohol (c) amine (d) azodye

6. _____ have been used in the synthesis of optically active alcolols

   (a) tyrosinases (b) dehydrogenases (c) laccases (d) lipases

7. The substrate of lysosome is an

   (a) carbohydrate (b) protein (c) peptidoglycan (d) RNA

8. The horse liver alcohol dehydrogenase is a

   (a) monomer (b) dimer (c) tetramer (d) enzyme complex

9. In proteins, Tm is the temperature at which _____ takes place

   (a) folding-unfolding (b) crystallization-dissolution

   (c) synthesis-breakdown (d) precipitation-solubilization

10. Circular dichroism is a tool to measure _____ structure of proteins

    (a) primary (b) secondary (c) tertiary (d) quartenary

PART B (10 x 2 = 20 Marks)

11. What is Henderson –hallebach equation? Explain its significance

12. Draw the Fischer projection diagram of D- and L- aspartic acid

13. List the Enzyme Commission (EC) classification of enzymes and their reactions.
14. What is covalent catalysis?
15. What are endorphins? Name two of them.
16. Name four applications of cyclodextrins.
17. What is combinatorial chemistry?
18. What is the most important residue in the active site of papain and elastase?
19. Explain hydrophobic collapse model of protein folding.
20. Differentiate thermodynamic and kinetic stabilities of proteins.

PART C (5 x 14 = 70 Marks)

21. a) Explain in detail the Cahn-Ingold-Prelog notation for assigning R or S configuration to molecules using a specific molecule as an example.

(OR)

b) Discuss the reaction mechanisms and compare the SN1, SN2 and E1 and E2 reactions.

22. a) Describe in detail the asymmetric synthesis of alpha aminoacids. Explain the various stages involved in the solid phase peptide synthesis.

(OR)

b) Explain the various stages in the process of synthesis of oligonucleotides.

23. a) (i) Give an account on the Enzyme commission (EC) classification of enzymes. (9)
(ii) Write a short note on the biochemical roles of five cofactors (5)

(OR)

b) Explain collisional and transition state theory of chemical reactions

24. a) Describe the structure and mechanism of alpha chymotrypsin.

(OR)

b) Discuss the structure and mechanism of lysozyme.

25. a) What are the various definitions of protein stability? Explain the contributions of hydrophobic interactions and hydrogen bonding to the stability of proteins

(OR)

b) What are the role of molecular chaperones? Explain in details the mechanism of action of molecular chaperones and chaperonins.

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