KUMARAGURU
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Register Number:…….

B.TECH DEGREE EXAMINATIONS: NOV/DEC 2014

(Regulation 2009)

Fourth Semester

BIOTECHNOLOGY

BTY108: Bioorganic Chemistry

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

Answer all the Questions:-

PART A (10 x 1 = 10 Marks)

1. Which **ONE** of the following is an optical isomer?
   a) $CH_2CH_3CHOHCH_3$ b) $CH_3CHOHCH_3$
   c) $CH_2CH_3CH_2CH_3$ d) $CH_2CH_3CHOH\ CH_2CH_3$
2. The following is the Henderson – Hesselbalch equation:
   a) $pH = pK_a + \log_{10}$ (acid/ salt) b) $pK_a = pH + \log_{10}$ (acid/ salt)
   c) $pK_a = pH + \log_{10}$ (salt/ acid) d) $pH = pK_a + \log_{10}$ (salt/ acid)
3. Changes in free energy, enthalpy and entropy can be expressed as ----------
   a) $\Delta H = \Delta G - T\Delta S$ b) $\Delta G = \Delta S - T\Delta H$
   c) $\Delta G = \Delta H - T\Delta S$ d) $\Delta S = \Delta G - T\Delta H$
4. Formation of C-C, C-S, C-O, and C-N bonds by condensation reactions coupled to ATP cleavage belongs to ---------- class of enzymes
   a) Oxidoreductase b) Ligase
   c) Isomerase d) Lyase
5. Which **ONE** of the following is termed as "**WILKINSON's CATALYST"?**
   a) $Rh(Ph_3R)_3Cl$ b) $Ph(Rh_3P)_3Cl$
   c) $Rh(Ph_3P)_3Cl$ d) $Rh(Rh_3R)_3Cl$
6. The stoichiometry ratio of Fe^{2+} and O_2 in hemoglobin is ----------
   a) 1:1 b) 1:2
   c) 1:3 d) 1:4

7. Which amino acid is present in the catalytic site of lysozyme?

   a) Gly-52 b) Asp -52

   c) Pro-52 d) Met-52

8. Fumarase need the presence of ---------- as co-enzyme

   a) FMN b) $NADP^+$

   c) NAD^+ d) FAD

9. H/D exchange is useful to find:

   a) Exchangeable solvent b) Exchangeable water

   c) Exchangeable hydrogen d) Exchangeable reactants

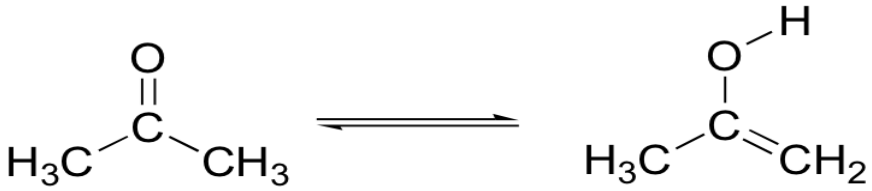
10. During protein folding, molecular chaperons prevents the ----------

    a) Disulphide bond formation b) hock

    c) Proline cis-trans isomersim d) Hydrophobic aggregation

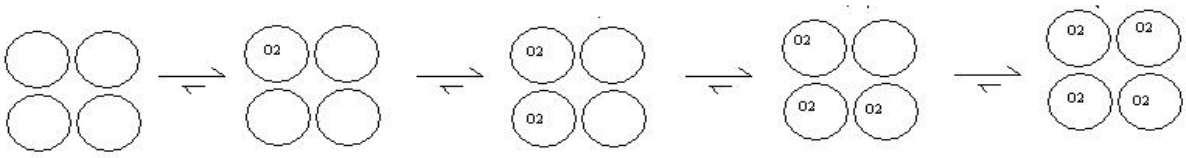
PART B (10 x 2 = 20 Marks)

11. Carefully analyze the following reaction and comment its salient features.



12. Define a buffer and quote an example

13. Observe the following pictorial representation and give your comments:



14. Outline the significance of activation energy

15. What is complex-crown ether?

16. Write the importance of combinatorial libraries

17. Define a catalytic triad with an example

18. Draw the structure of NAM-NAG

19. List out the various methods adopted to investigate the protein folding

20. What is site directed mutagenesis?

PART C (5 x 14 = 70 Marks)

21. a) (i) Describe in detail the mechanism of SN1 and SN2 reactions with apt examples (10)

    (ii) Classify the organic reactions with suitable examples (4)

(OR)

	b)	(i)	Derive the Henderson-Hesselbalch equation and quote its significance	(7)
		(ii)	Give a detailed account on the significance of RS and EZ notations with appropriate examples	(7)
22.	a)	(i)	Categorize the enzymes and write few examples	(6)
		(ii)	**"Even though interaction between an enzyme and substrate is an ordered (ΔS) process, sequentially the products are formed by overcoming the thermodynamical barrier".** In your viewpoint, substantiate the statement with suitable postulates	(8)

(OR)

	b)	(i)	Discuss the mechanism of covalent catalysis with suitable examples	(10)
		(ii)	Write a short note on the significance of free energy in an *in vivo* system	(4)
23.	a)	(i)	Briefly explain the steps involved in the chemical synthesis of peptides	(10)
		(ii)	Outline the action of a neuropeptide with an example	(4)

(OR)

	b)	(i)	How pain killers recognize their specific receptors? Explain with an example	(7)
		(ii)	Elaborate the mechanism of oxygen binding with iron (oxidant status two) by a neat sketch	(7)
24.	a)		Describe the mechanism of catalysis mediated by chymotrypsin with a neat labeled sketch	

(OR)

	b)	(i)	Write a short note the NAD dependent redox reactions	(4)
		(ii)	How ribonucleases catalyze the hydrolysis of RNA? Explain the mechanism with a neat labeled diagram	(10)
25.	a)	(i)	Give a detailed account on the sequential folding mechanism of barnase	(10)
		(ii)	How the conformation of a protein is stabilized?	(4)

(OR)

	b)		Describe the various models of protein folding and add a brief note on the free energy landscapes	

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