LOYOLA COLLEGE (AUTONOMOUS), CHENNAI – 600 034

M.Sc. DEGREE EXAMINATION – **BIOTECHNOLOGY**

FIRST SEMESTER – NOVEMBER 2015

BT 1826 - BIOCHEMISTRY & BIOPHYSICS

Date : 05/11/2015 Dept. No. Max. : 100 Marks
Time : 01:00-04:00

PART – A **(20 MARKS)**

Answer ALL the Questions

I. Choose the correct answer **(5 x 1 = 5)**

1. Which among the following has the highest boiling point?
   a) Ethanol b) Methanol c) Propanol d) Water

2. The pH at which DNA is highly viscous is
   a) 0 b) 7 c) 13 d) 14

3. The enzymes for oxidation of fatty acids is present in
   a) Mitochondrial matrix b) Cytoplasm c) Chloroplast d) Cellwall

4. Conventional HPLC columns are made of which of the following?
   a)Brass b) Polystyrene c) steel d)Titanium

5. Which of the following is used to reduce disulphide linkage?
   a) APS b) Mercaptoethanol c) TEMED d) Riboflavin

II. State whether the following are true or false, if false, give reason **(5 x 1= 5)**

6. Hyperventilation may cause alkalosis.
7. β turns possess four amino acid residues.
8. Long chain fatty acids cannot enter the mitochondria.
9. Fixed angle rotors are suitable for pelleting.
10. TOF is a kind of ionizer.

III. Complete the following **(5 x 1= 5)**

11. The internal reference electrode in a combination electrode is _____.
12. The torsion angle between C_α and C is denoted as_____.
13. Pyruvate is converted to acetyl-coA by _____ enzyme complex.
14. The charge on a charged amino acid becomes neutral at _____ pH
15. The technique used to determine the structure of proteins in solution is _____.

IV. Answer the following, each within 50 words **(5 x 1 = 5)**

16. State the first law of thermodynamics.
17. What are anomers?
18. Define metabolic control.
19. Give the expression for Beer- Lambert's law.
20. Mention the purpose of amphyolytes in IEF.

PART B

Answer the following, each within 500 words. (5 x 8 = 40 marks)
Draw diagrams wherever necessary

21. (a) i. Derive Henderson- Hasselbalch equation.
ii.What is the concentration of OH^- in a solution containing H^+ concentration of 1.3×10^{-4}M?

OR

b) i) Explain the principle and working of pH meter.

22. (a) Comment on:
i. Polysaccharide ii. Triacylglycerol

OR

(b) Discuss the four levels of structural organization of proteins.

23. (a) Write an overview on amino acid biosynthesis.

OR

(b) Summarize the steps involved in fatty acid synthesis.

24. (a) Illustrate sub cellular fractionation of cell organelles using differential centrifugation.

OR

(b) Employ a technique to image the glucose uptake by tissues in the body.

25. (a) Explain the principle of nuclear magnetic resonance in the structure determination.

OR

(b) Design an experiment to separate and identify proteins based on their mass and charge.

PART – C

Answer any TWO of the following, each within 1500 words. (2 x 20 = 40 Marks)
Draw diagrams wherever necessary.

26. Classify amino acids and lipids based on the structure with suitable examples.
27. Write in detail about the steps involved in complete oxidation of glucose and regulation.
28. Describe the principle and instrumentation of HPLC and GLC.
29. Elaborate on 2D gel electrophoresis of proteins.

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