MAR IVANIOS COLLEGE (AUTONOMOUS)
THIRUVANANTHAPURAM

Reg. No. :………………… Name :…………………

First Semester Career Related B.Sc. Degree Examination, November 2015
First Degree Programme under CBCSS
Complementary Course: Biochemistry – I (for Botany and Biotechnology)
AUBB131: Introduction to Biochemistry

(for 2015 Admissions Only)

Time: **3** Hours Max. Marks: **80**

SECTION – A

*Answer **ALL** questions in one or two sentences.*

1. Define Gibb's free energy.
2. Which is the stronger acid among Benzoic acid (K_a – 6.5×10^{-5}) and hydrocyanic acid (K_a – 4.9×10^{-10}) ?
3. State Beer – Lambert's law.
4. List out two functions of emulsifying agent suggesting suitable example.
5. What are the factors that affect Rf value ?
6. Distinguish between conjugate acid and conjugate base with suitable example.
7. Write down Donnan equation.
8. What are the characteristic features of a peptide bond ?
9. Distinguish between osmosis and diffusion.
10. What is the role of SDS in SDS – PAGE ?

(10 × 1 = 10 Marks)

SECTION – B

*Answer any **EIGHT** questions, not exceeding a paragraph.*

11. Discuss about the role of hydrogen bonds and disulphide bonds in the stability of protein structure.
12. How is molar extinction coefficient useful in estimations ?
13. What do you know about Watson – Crick base pair ? Draw an example.

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14. What happens when blood pH change ?
15. How will you check the purity of a protein after separation and purification ?
16. Give a note on affinity chromatography.
17. Discuss about the significance of Henderson – Hasselbalch equation.
18. Describe the principle and applications of electrophoresis.
19. Distinguish between exothermic and endothermic reaction.
20. Calculate the pH of a solution of 5.0×10^{-4} M HCl.
21. What happens when a cell is placed in hypotonic, hypertonic and isotonic solutions ?
22. What is the cause of respiratory distress syndrome ?

(8 × 2 = 16 Marks)

SECTION – C

*Short essay type : Answer any **SIX** questions.*

23. Distinguish between gel permeation and ion exchange chromatography.
24. Give an idea about isomerism in biomolecules.
25. Discuss about Ist and IInd laws of thermodynamics and their significance in biological systems.
26. Discuss the principle and working of a pH meter.
27. What are the common functional groups observed in biomolecules ? Cite suitable examples and draw their structures.
28. What do you mean by isoelectric focusing ?
29. Describe the instrumentation of a colorimeter. What are the difference between a colorimeter and spectrophotometer ?
30. Discuss about the structural features of water molecules and their role as universal solvent.
31. Discuss about different types of glycosidic linkages in carbohydrate.

(6 × 4 = 24 Marks)

SECTION – D

*Long essay type : Answer any **TWO** questions.*

32. Discuss about different types and application of centrifugation.
33. Write an essay on colloids and their biological significance.
34. Explain the action of buffers. Discuss about the function and significance of physiologic buffers.
35. Describe the different modes for expressing the concentration of solutions.

(2 × 15 = 30 Marks)

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