



MAR IVANIOS COLLEGE (AUTONOMOUS)
THIRUVANANTHAPURAM

Reg. No. :.....

Name :.....

First Semester Career Related B.Sc. Degree Examination, November 2014

First Degree Programme under CBCSS

Complementary Course: Biochemistry – I (for Botany and Biotechnology)

AUBB131: Introduction to Biochemistry

Time: 3 Hours

Max. Marks: 80

SECTION – A

Answer ALL questions in one or two sentences.

1. What is Tyndall effect ?
2. Calculate the pH of a solution with $[H^+]$ 0.0000001g%.
3. Why is surface tension important in biology ?
4. Write down Gibb's Helmholtz equation.
5. Define R_f .
6. Define partition coefficient.
7. What is fluorescence ?
8. Show the formation of a peptide bond.
9. What is the difference between resonance and tautomerism ?
10. What do you mean by van der Waal's interaction ?

(10 x 1 = 10 Marks)

SECTION – B

Answer any EIGHT questions, not exceeding a paragraph.

11. State Beer Lambert's law and define molar extinction coefficient.
12. Explain the principle of sedimentation technique.
13. Which are the two types of glycosidic bonds formed in biomolecules ? Give one example for each.
14. Name the important buffers in biological system.
15. State the differences between diffusion, osmosis and dialysis.

1021

16. Explain with figure the structure of a water molecule.
17. What is the importance of hydrophobic interaction ?
18. Explain Helmholtz Guoy double layer theory.
19. Define the ionic product of water.
20. State the principle and anyone application of paper chromatography.
21. What is the concentration of sugar ($C_{12}H_{22}O_{11}$) in moles / litre, if 20 gm of it is dissolved in enough water to make a final volume of 2 litres ?
22. Calculate the osmotic pressure at 273 K of a 5% solution of urea. (Molecular mass of urea = 60). $R = 0.0821 \text{ litre.atm / degree / mol}$.

(8 x 2 = 16 Marks)

SECTION – C

Short essay type : Answer any SIX questions.

23. Derive Henderson Hasselbach equation.
24. Explain Donnan membrane equilibrium.
25. Describe the different types of centrifugation techniques.
26. Discuss the principle and working of a pH meter.
27. What do you mean by isomerism ? Explain with examples the different types of isomers.
28. Draw Watson and Crick base pairing in DNA.
29. Describe the instrumentation of a colorimeter. What are the differences between a colorimeter and spectrophotometer ?
30. Discuss the principle and applications of ion exchange chromatography.
31. State Vant Hoff's laws of osmotic pressure. What are the applications of osmosis in biology ?

(6 x 4 = 24 Marks)

SECTION – D

Long essay type : Answer any TWO questions.

32. Explain the principle, methodology and applications of SDS PAGE.
33. Explain the principle and applications of Gel filtration chromatography.
34. Discuss the laws of thermodynamics. What are their applications in biology ?
35. How are colloids classified ? Give examples for each class. What are the applications of colloids in biology ?

(2 x 15 = 30 Marks)
