



MAR IVANIOS COLLEGE (AUTONOMOUS)
THIRUVANANTHAPURAM

Reg. No. :.....

Name :.....

Third Semester B.Sc. Degree Examination, November 2016

First Degree Programme under CBCSS

Complementary Course: Chemistry – III (for Botany)

AUCH331.2a: Physical & Inorganic Chemistry

(for 2014 Admissions – Improvement Only)

Time: 3 Hours

Max. Marks: 80

SECTION – A

Answer ALL questions in a word or one or two sentences.

1. Write one carrier gas used in chromatography.
2. What is R_f value ?
3. Give an example of chromophore.
4. What is hyperchromic effect ?
5. What is meant by TLC ?
6. Curie is _____.
7. Write Arrhenius equation.
8. An example of completely miscible liquid pair is _____.
9. According to _____ concept, acids are proton donors.
10. State Raoult's Law.

(10 × 1 = 10 Marks)

SECTION – B

Answer any EIGHT questions, not exceeding a paragraph.

11. Calculate the half life period of a first order reaction whose rate constant is 200 s^{-1} .
12. Distinguish between homogeneous and heterogeneous catalysis.
13. Calculate the pH of 0.03M solution of HCl at 25°C .
14. What is the effect of impurity on partially miscible liquids ?
15. What are ideal and non – ideal solutions ?

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16. Define Nernst distribution law.
17. Mention the advantages of HPLC.
18. What is partition chromatography ?
19. State Franck – Condon principle.
20. What are auxochromes ?
21. What is chemical shift ?
22. Write Bohr – Einstein equation.

(8 × 2 = 16 Marks)

SECTION – C

Short essay type : Answer any SIX questions.

23. Distinguish between order and molecularity.
24. Give an account of pseudo order reaction.
25. What is meant by buffer solution ? Explain buffer action of a solution of ammonium acetate.
26. Describe the principle of Fractional Distillation.
27. Mention the advantages of HPLC.
28. What is colorimetry ? What are the advantages of colorimetric analysis ?
29. What are red and blue shifts ? Explain.
30. What is NMR frequency ? Explain.
31. How many signals would you obtained in the NMR spectrum of
 - i). $\text{CH}_3\text{-OH}$
 - ii). $\text{C}_2\text{H}_5\text{-OH}$.

(6 × 4 = 24 Marks)

SECTION – D

Long essay type : Answer any TWO questions.

32.
 - i). Derive an expression for rate constant of a first order reaction. Explain the influence of temperature on reaction rates.
 - ii). What are the characteristics of catalytic reactions ?
33.
 - i). Explain briefly the principle and application of NMR spectroscopy.
 - ii). What are the general applications of UV spectroscopy ?
34.
 - i). Describe (a). Column chromatography (b). Ion exchange chromatography
 - ii). Explain the separation of aminoacids by chromatographic methods.
35.
 - i). What is MRI ? How does it work ?
 - ii). Draw the low resolution and high resolution of PMR spectrum of ethanol.

(2 × 15 = 30 Marks)

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