25U2122 (Pages: 2) Name : .....

Reg. No : .....

SECOND SEMESTER B.Voc. DEGREE EXAMINATION, APRIL 2026

(FYUGP)

CC25CHE2MN108 - FUNDAMENTAL CONCEPTS AND ANALYTICAL TECHNIQUES

(Chemistry - Minor Course)

(2025 Admission - Regular)

Time: 2.0 Hours Maximum: 70 Marks

Credit: 4

Part A (Short answer questions)

Answer ***all*** questions. Each question carries 3 marks.

1. Define a standard solution? List out the condition to be satisfied for a solution to be Primary standard. [Level:2] [CO1]
2. How the molarity depends on temperature? [Level:2] [CO1]
3. Why is symmetric stretching of CO_2 IR inactive? [Level:2] [CO2]
4. Differentiate between fundamental band and overtone band in IR spectra. [Level:2] [CO2]
5. Draw the various energy levels in molecule and explain. [Level:2] [CO2]
6. Calculate wave number and frequency for a radiation of wavelength 200nm. [Level:2] [CO2]
7. Briefly describe about the basic principle and region involved in electronic spectroscopy. [Level:2] [CO3]
8. Draw a schematic diagram of PMR spectrum of pure methanol and label the peaks. [Level:2] [CO3]
9. Explain the term Rf value and its significance in chromatography. [Level:2] [CO4]
10. Compare frontal and elution methods of chromatographic development. [Level:2] [CO4]

(Ceiling: 24 Marks)

Part B (Paragraph questions/Problem)

Answer ***all*** questions. Each question carries 6 marks.

11. Explain the titration curves for (a) Strong acid – Strong base titration, (b) Weak acid – Strong base titration [Level:2] [CO1]
12. Give a brief account of using potassium permanganate in titrimetry with special reference to the detection of end point. [Level:2] [CO1]

13. Summarize the influence of hydrogen bonding on the IR spectra of alcohols and carboxylic acids. [Level:2] [CO2]

14. Describe the characteristic IR absorption peaks for common functional groups, such as alcohols, aldehydes, and carboxylic acids. [Level:2] [CO2]

15. Explain the principle of infrared (IR) spectroscopy and how molecular vibrations are analysed using it. [Level:2] [CO2]

16. Discuss the importance of UV-Visible spectroscopy in the study of conjugated systems and Geometrical isomers. [Level:2] [CO3]

17. Compare thin layer chromatography and paper chromatography based on their principle and applications. [Level:2] [CO4]

18. Explain how chromatographic techniques help in the separation and identification of mixtures. [Level:2] [CO4]

(Ceiling: 36 Marks)

Part C (Essay questions)

Answer any ***one*** question. The question carries 10 marks.

19. (a) Define oxidation number. Discuss the oxidation number concept of oxidation and reduction. Explain the term oxidant and reductant with illustrative example. [Level:2] [CO1]

    (b) Calculate the oxidation number of Mn in KMnO4.

20. Describe the concept of chemical shift and explain the factors that influence chemical shift values in NMR spectra. [Level:2] [CO3]

(1 × 10 = 10 Marks)

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