(NO. OF PAGES: 2)

(FOR THE CANDIDATES ADMITTED DURING THE ACADEMIC YEAR 2020-21 ONLY)

SUBJECT CODE 20UCY611

REG.NO. :

N.G.M.COLLEGE (AUTONOMOUS): POLLACHI

END-OF-SEMESTER EXAMINATIONS: MAY 2023

B.Sc . CHEMISTRY **MAXIMUM MARKS: 70**

VI SEMESTER **TIME : 3 HOURS**

PART - III

PHYSICAL METHODS AND CHEMICAL STRUCTURE

SECTION - A (10 X 1 = 10 MARKS)

ANSWER THE FOLLOWING QUESTIONS.
MULTIPLE CHOICE QUESTIONS. **(K1)**

1. Which of the following absorb IR radiation?
   a) Homonuclear diatomic molecule b) Heteronuclear diatomic molecule
   c) Diatomic molecules will not absorb IR c) both a & b
2. The Raman spectrum is exhibit the strokes line when _____.
   a) $\Delta v > 0$ b) $\Delta v < 0$ c) $\Delta v = 0$ d) does not depend on Δv
3. The approximate δ value of methyl proton in NMR is _____.
   a) 1.3 b) 1.5 c) 0.9 d) 2.5
4. Who discovered the mass spectrometer?
   a) Francis Aston b) J. J Thomson c) Ernest O. Lawrence d) Walter Kaufmann
5. For a diamagnetic material which of the following property is correct?
   a)Magnetic susceptibility < 0 b) Magnetic susceptibility < 0
   c) Magnetic susceptibility = 0 d) Magnetic susceptibility = 1

ANSWER THE FOLLOWING IN ONE (OR) TWO SENTENCES **(K2)**

6. Which solvents are ideal for IR spectrum?
7. What is stokes line?
8. Explain why TMS is used as reference in NMR.
9. What is nitrogen rule?
10. What is the affect of temperature on magnetic susceptibility of ferromagnetic material?

(CONTD …. 2)

SECTION – B (5 X 4 = 20 MARKS)

ANSWER EITHER (a) OR (b) IN EACH OF THE FOLLOWING QUESTIONS.

(K3)

11. a) What are the Factors affecting Vibrational frequencies in IR?

(OR)

b) Discuss the IR stretching frequencies of carbonyl compounds

12. a) Write the selection rules for Raman Spectroscopy?

(OR)

b) Elaborate the applications of UV spectral method.

13. a) What is chemical shift? Summerize the factor that influences chemical shift.

(OR)

b) Elaborate various factors that affect 'g' value.

14. a) Explain McLafferty rearrangement with example.

(OR)

b) Discuss the crystal structures of NaCl, Diamond & Graphite

15. a) Define the terms, total molar polarization, orientation polarization & distribution polarization.

(OR)

b) Discuss Curie – Wein's law and its application

SECTION – C (4 X 10 = 40 MARKS)

ANSWER ANY FOUR OUT OF SIX QUESTIONS
(16th QUESTION IS COMPULSORY AND ANSWER ANY THREE QUESTIONS)

16. Explain the theory and instrumentation of Mass Spectroscopy.
17. Discuss in detail the Finger print Region in IR spectroscopy
18. Explain the differences between Raman & IR spectra. Give the characteristics of Raman lines.
19. Discuss the various types of defects in crystals.
20. Illustrate the mechanisms of coupling in NMR
21. Discuss the application of Magnetic properties in identifying the geometry of simple and complex molecules.

****

ETHICAL PAPER