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(FOR THE CANDIDATES ADMITTED **SUB CODE 21UCY611**

DURING THE ACADEMIC YEAR 2021 ONLY) **REG.NO. :**

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

END-OF-SEMESTER EXAMINATIONS : MAY 2024

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

SEMESTER : VI **TIME : 3 HOURS**

PART - III

PHYSICAL METHODS AND CHEMICAL STRUCTURE

SECTION -A (10x1=10MARKS)

ANSWER THE FOLLOWING QUESTIONS.(K1)

1. Which property is primarily studied using IR spectroscopy?
   a) Mass b) Charge
   c) Absorption of light d) Vibrational modes

2. UV spectroscopy is a type of _____
   a) Atomic spectroscopy b) Molecule spectroscopy c) Absorption spectroscopy
   d) Emission spectroscopy

3. NMR techniques require which electromagnetic radiation _____

   a) IR region b) Microwave region
   c) Radiowaves d) X-Ray region

4. The second part of a mass spectrometry is
   a) Sample inlet system b) Detectors c) Ion source d) Mass analyser

5. Unit of dipole moment is
   a) Einstein b) Debye c) Faraday d) Curie

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

6. What is molecular spectroscopy?
7. Write a note on Raman spectroscopy
8. What is TMS ?
9. Write a note on mass spectra
10. Define: Electrical properties of molecules

ETHICAL PAPER

SECTION -B (5x4=20MARKS)

ANSWER EITHER (a) OR (b) IN EACH OF THE FOLLOWING QUESTIONS.(K3)

11. a) Write a note on regions of electromagnetic spectrum

(OR)

b) Give an account of the factors affecting carbonyl stretching frequency

12. a) Explain the types of electronic transitions

(OR)

b) Give an account of stokes and anti- stokes lines

13. a) What is hyperfine splitting .Explain

(OR)

b) Write the theory and principle of NMR spectroscopy

14. a) What is nitrogen rule?

(OR)

b) Write a note on unit cell and crystal systems

15. a) Give an account of Curie-Weiss law

(OR)

b) Write a note on application of dipole moment in the study of simple molecules

SECTION- C (4x10=40MARKS)

ANSWER ANY FOUR OUT OF SIX QUESTIONS (16th QUESTION IS COMPULSORY AND ANSWER ANY THREE QUESTIONS) (K4/ K5)

16. Write a note on rigid and non -rigid rotor models

17. Give an account of fermi resonance and finger print region

18. Explain Birge -spooner method of evaluation of dissociation energy from electronic spectra

19. Write a note on factors affecting chemical shift

20. Give an account of X-ray examination of crystal by Debye-Scherer method

21. Explain the following

(i) Orientation polarization (ii) Magnetic susceptibility

(5+5)