

N.G.M.COLLEGE (AUTONOMOUS) : POLLACHI
END-OF-SEMESTER EXAMINATIONS : MAY 2026

B.SC CHEMISTRY

MAXIMUM MARKS: 75

SEMESTER VI

TIME : 3 HOURS

PART - III

PHYSICAL METHODS AND CHEMICAL STRUCTURE

SECTION – A

(10 X 1 = 10 MARKS)

ANSWER THE FOLLOWING QUESTIONS.

(K1)

1. Molecular spectroscopy deals with the study of: _____
a) nuclear reactions b) interaction of electromagnetic radiation with molecules
c) electron emission from metals d) chemical kinetics
2. Raman spectroscopy is based on: _____
a) absorption of radiation b) emission of radiation
c) elastic scattering d) Inelastic scattering
3. Chemical shift is measured in: _____
a) hz b) ppm c) nm d) cm^{-1}
4. Molecular ion peak is also called: _____
a) parent peak b) daughter peak c) satellite peak d) isobaric peak
5. A polar molecule possesses: _____
a) zero dipole moment b) permanent dipole moment c) equal charge distribution d) no bond polarity

ANSWER THE FOLLOWING IN ONE (OR) TWO SENTENCES

(K2)

6. What is the name of the interaction between fundamental and overtone?
7. What type of transition is involved in UV visible spectroscopy?
8. Give the g value of free electron.
9. Give the total number of crystal system.
10. What are paramagnetic substances?

SECTION – B

(5 X 5 = 25 MARKS)

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

(K3)

11. a) Summarize the various factors affecting carbonyl stretching frequency.
(OR)
b) List the importance of finger print region.
12. a) Explain the mechanism of Raman effect.
(OR)
b) Write a note on auxochromes and chromophores.

13. a) Discuss the splitting of signals in NMR spectroscopy.

(OR)

- b) Illustrate and explain the NMR spectrum of toluene.

14. a) How will you determine radius ratio?

(OR)

- b) Elaborate the hexagonal close packing structure with neat sketch.

15. a) Write a note on polar and non polar molecules.

(OR)

- b) Write a note on different types of magnetism.

SECTION – C

(5 X 8 = 40 MARKS)

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

(K4 (Or) K5)

16. a) With a neat sketch ,explain the various types of vibrations in IR spectroscopy.

(OR)

- b) Determine bond length and mass of atom using microwave spectroscopy.

17. a) Describe the type of electronic transition with neat diagram.

(OR)

- b) Using Woodward Fischer rule, how will you calculate absorption maxima of dienes.

18. a) Discuss various factors that affect the chemical shift values.

(OR)

- b) Explain the spectrum and splitting pattern of methyl radical using ESR spectroscopy.

19. a) Draw and describe the structure of sodium chloride.

(OR)

- b) Elaborate the point defects with neat sketch.

20. a) Determine the dipole moment of polar gas experimentally.

(OR)

- b) Determine magnetic susceptibility of paramagnetic substance using Guoy balance.
