

20001120



20001120



Reg. No.....

Name.....

M.Sc. DEGREE (C.S.S.) EXAMINATION NOVEMBER 2020

Second Semester

Faculty of Science

Branch : Chemistry

AN2C08/AP2C08/CH2C08/PH2C08/POH2C08—MOLECULAR SPECTROSCOPY

(2012—2018 Admissions)

(Common to all Branches of Chemistry)

Time : Three Hours

Maximum Weight : 30

Section A

Answer any ten questions.

Each question carries weight 1.

1. Discuss the main factors that influence the intensity of absorption.
2. What you mean by relaxation time ?
3. What are the applications of Lamb dip spectroscopy ?
4. What is Stark effect ? What are its applications ?
5. What is finger print region in IR spectra ? Why is it called so ?
6. How does a microwave spectrum helps in getting structural parameters ?
7. What is free electron model ?
8. What is meant by population of energy levels in NMR ?
9. What is double irradiation ?
10. What is the principle of solid state NMR ?
11. What are the factors that influence the g value ?
12. What is quadrupole effect ?
13. Discuss the principle of Mössbauer spectroscopy ?

(10 × 1 = 10)

Turn over





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Section B

*Answer any **five** questions by attempting not more than three questions from each bunch, Each question carries weight 2.*

BUNCH 1

14. How radiative process differ from non-radiative process ?
15. Distinguish between symmetric top and asymmetric top.
16. What are the disadvantages of dispersive IR ?
17. Discuss the Birge and Sponer method of calculation of heat of dissociation.

BUNCH 2

18. Discuss the various factors influencing the chemical shift in NMR.
19. Explain the Nuclear Overhauser Effect.
20. Compare fine and hyperfine structures EPR spectroscopy.
21. Explain the Mössbauer spectrum of Fe (II) cyanide.

(5 × 2 = 10)

Section C

*Answer any **two** questions.
Each question carries weight 5.*

21. (a) Explain the applications of microwave spectroscopy in chemical analysis.
(b) What are the various groups appeared in the finger print region of FT - IR spectra ? Discuss the bonding vibrations with their values.
22. (a) What are the applications of UV spectroscopy ?
(b) What is meant by simplification of a second order spectra in NMR ? Why is it required ?
23. (a) What are the advantages of two dimensional NMR ?
(b) Explain the EPR hyper-spin splitting involving more than one nucleus.
24. (a) Distinguish between NMR and NQR.
(b) 'For analyzing certain metal complexes. Mössbauer spectroscopy is better than InfraRed spectroscopy'. Discuss with examples

(2 × 5 = 10)

