G 2798 (Pages : 2) Reg. No.....

Name.....

M.Sc. DEGREE (C.S.S.) EXAMINATION, AUGUST 2016

Second Semester

Faculty of Science

Branch : Chemistry

AN 2C 08 / AP 2C 08 / CH 2C 08 / PH 2C 08 / POH 2C 08—MOLECULAR SPECTROSCOPY

(Common to all Branches of Chemistry)

[2012 Admissions]

Time : Three Hours Maximum Weight : 30

Section A

Answer any **ten** *questions.*
Each question carries a weight of 1.

1. What are the importances of spectroscopy ?
2. What is meant by selective decoupling ?
3. What is meant by Doppler broadening ?
4. What is NOE effect ?
5. What are the disadvantages of dispersive IR ?
6. What is meant by magic angle spinning ?
7. What are the difficulties in obtaining ^{13}C-NMR spectra of an organic compound ?
8. What is meant by double resonance ?
9. How will you perform selective decoupling ?
10. What is meant by mutual exclusion principle ?
11. What are the applications of X-ray photoelectron spectroscopy ?
12. How hydrogen bonding can be observed in IR spectroscopy ?
13. What are the applications of Stark Effect ?

(10 × 1 = 10)

Section B

Answer any **five** *questions.*
Each question carries a weight of 2.

14. Discuss the terms COSY and HETCOR.
15. Discuss the energy dissipation from radiative and non-radiative processes.
16. Discuss the Morse potential energy diagram.

Turn over

17. Briefly discuss the FT spectroscopy. What are its advantages ?
18. Briefly explain the Birge and Sponer method.
19. Write a short essay about the NQR spectroscopy.
20. What is meant by second order effect ? Explain its simplification.
21. Explain the microwave spectrum of a non rigid rotator.

(5 × 2 = 10)

Section C

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

22. Explain Raman Spectroscopy and its applications.
23. Write an essay about the EPR spectroscopy.
24. What is the principle of Mossbauer spectroscopy ? What are its applications ?
25. What are Lasers ? What are different types of lasers ? Explain the use of lasers in spectroscopy.

(2 × 5 = 10)