S. NO: 36 BATCH: 2003 - 2014 Reg. No.:

END OF SEMESTER EXAMINATIONS, APRIL / MAY – 2017
MOLECULAR SPECTROSCOPY
SUBJECT CODE : 08UACH09

MAJOR : B.Sc (Chemistry) SEMESTER : VI
TIME : 3 HOURS MAX. MARKS: 75

SECTION – A (10 X 1 = 10)

Answer the Following:

1. What is meant by electromagnetic radiations?
2. Write the selection rule formula for rigid diatomic rotator.
3. Write the two kinds of fundamental vibrations.
4. What is force constant?
5. State mutual exclusion rule.
6. Define Chromophores.
7. Define chemical shift.
8. What is geminal coupling?
9. What is hyperfine splitting?
10. Define base peak.

SECTION – B (5 X 4 = 20)

Answer the Following:

11. a) Give the properties of electromagnetic radiations.

[OR]

b) Describe the selection rules fro rotational spectra.

12. a) Write short notes on selection rule for IR spectra.

[OR]

b) Discuss about finger print region.

13. a) Give the types of electronic transitions.

[OR]

b) Calculate the λ_{max} for cyclohexadiene.

14. a) What are the factors affecting the chemical shift?

[OR]

b) Discuss PMR spectra of ethanol.

15. a) Give the applications of ESR spectroscopy.

[OR]

b) Write the Mclaffarty rearrangement.

SECTION – C (5 X 9 = 45)

Answer the Following:

16. a) How would you determine the moment of inertia and bond length from rotational spectra of diatomic molecules.

[OR]

b) Explain the instrumentation of microwave spectroscopy.

17. a) Explain the types of molecular vibrations.

[OR]

b) Discuss the applications of IR to organic compounds.

18. a) Give the theory of rotational Raman spectroscopy.

[OR]

b) Explain Frank condon principle and Absorption intensity shifts.

19. a) Describe about Coupling constant and spin – spin coupling.

[OR]

b) Discuss about the instrumentation of PMR spectroscopy.

20. a) Explain the structural determination of benzene anion using ESR.

[OR]

b) Discuss the instrumentation of Mass spectrometry.

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