K19U 0088

Reg. No. : ....

Name : ....

VI Semester B.Sc. Degree (CBCSS – Reg./Supple./Improv.)
Examination, April 2019
(2014 Admission Onwards)
CORE COURSE IN CHEMISTRY
6B16 CHE : Physical Methods in Chemistry

Time : 3 Hours   Max. Marks : 40

SECTION – A

Answer **all** questions. **Each** question carries **one** mark.

1. What are auxochromes ?

2. How many modes of vibrations are possible for CO_2 ?

3. Give the point group of N_2O_4.

4. Name the internal standard in nmr.   **(1×4=4)**

SECTION – B

Answer **any seven** questions. **Each** question carries **2 marks.**

5. What is Born Oppenheimer approximation ?

6. Using Woodward Feiser rule calculate λ_{max} for 3,4-dimethylpent-3-ene-2-one.

7. How will you distinguish 1-chloropropane and 2-chloropropane from their nmr spectra ?

8. State and explain the rule of mutual exclusion.

9. What is the principle of AAS ?

10. State and explain Beer Lamberts law.

11. What is meant by zero point energy ?

P.T.O.

12. Explain the fragmentation pattern of acetaldehyde.

13. List any two uses of carbon nano tubes.

14. Identify the mirror planes present in BF_3. (7×2=14)

SECTION – C

Answer **any 4** questions. **Each** question carries **3** marks.

15. Explain microemulsion method for the synthesis of nanoparticles.

16. Discuss the significance of group frequency concept in IR spectroscopy.

17. What are the advantages of polarographic analysis ?

18. Discuss the significance of Frank Condon principle in explaining the intensities of spectral lines in electronic spectra.

19. Explain the principle and working of SEM.

20. Write notes on a) chemical shift b) spin spin coupling. (3×4=12)

SECTION – D

Answer **any 2** questions. **Each** question carries **5** marks.

21. a) Explain the selection rules for Raman spectroscopy. 2

    b) Discuss the quantum theory of Raman scattering. 3

22. Explain the different kinds of symmetry elements and symmetry operations.

23. Write notes on :
    a) amperometric titration
    b) half wave potential
    c) diffusion current.

24. Discuss the theory and instrumentation of microwave spectroscopy. (2×5=10)