K20U 0093

VI Semester B.Sc. Degree (CBCSS-Reg./Supple./Improv.)
Examination, April 2020
(2014 Admission Onwards)
CORE COURSE IN CHEMISTRY
6B16CHE : Physical Methods in Chemistry

Time : 3 Hours

Max. Marks : 40

SECTION – A

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

1. Give the number of fundamental vibrations for NH_3.

2. What is a chromophore ?

3. Give one example for C_{2v} point group.

4. Name the internal standard in nmr.

(1×4=4)

SECTION – B

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

5. Write two advantages of Raman spectra over IR spectra.

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

7. Sketch the nmr spectrum of acetaldehyde and identify the peaks.

8. State Frank condon principle.

9. What is McLafferty rearrangement ?

10. How is AAS used in inorganic analysis ?

11. What is meant by diffusion current ?

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12. What is an inversion center ?

13. List any two uses of nanoparticles.

14. What do you mean by meta stable ion ?   **(7×2=14)**

SECTION – C

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

15. Explain the construction and working of dropping mercury electrode.

16. Discuss the chemical methods for nano particle synthesis.

17. What are the advantages and disadvantages of amperometric titration ?

18. What are the factors affecting chemical shift ?

19. Give three applications of carbon nanotubes.

20. Explain the terms proper and improper rotation with suitable example.
                                                                                          (3×4=12)

SECTION – D

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

21. Discuss the methods for the characterisation of nanoparticles.

22. Explain the group frequency concept. What are the factors affecting IR ?

23. Describe the theory and instrumentation of spectrophotometry.

24. Discuss the quantum theory of Raman scattering.   **(2×5=10)**

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