

S. No. of Question Paper: 1923

Roll No.

Unique paper Code : 42173919

GC-3

Name of the Paper : Analytical Techniques involved in pesticide Analysis

Name of the Course : B. Sc (CBCS) Applied Life Science

Semester : III

Duration : 3 Hours

M. M. : 75

Answer five questions out of the following. All questions carry equal marks.

1. Answer the following; 10 x 1.1/2

- Define base peak in mass spectroscopy.
- What is the relation between frequency and wave length?
- What is excited triplet state?
- Discuss reduced mass.
- what do you understand by parent ion peak?
- Discuss chromophores with examples.
- Why TMS is used as reference solvent in ¹H NMR spectroscopy?
- Explain $n - \pi^*$ transition.
- What are I.R. active molecules?
- What are Auxochromes ? Discuss with an example.

¹H NMR

2. Discuss the following, 3x5

- Which is less stable excited singlet state or triplet state? Explain.
- Comparison of $n - \sigma^*$ transition in U V spectrum for CH_3Cl and CH_3I .
- characteristic transitions in $\text{CH}_2=\text{CH}_2$ and $\text{CH}_3\text{COC}_2\text{H}_5$?

3. Answer the following, 3 x 5

- How would you explain the $\nu \text{C} = \text{O}$ vibrations in HCHO , when hydrogen is substituted by $-\text{CH}_3$ group?

b. Which of the following absorbs at higher frequency? Explain.

N – H and O – H

c. Discuss the role of electron withdrawing group in shifting of vibrational frequencies. Explain with suitable example.

4. Discuss the following,

3X5

a. Chemical shift of methyl protons signals in, $\text{CH}_3\text{-O-}$, $\text{CH}_3\text{-I}$, and $\text{CH}_3\text{-Cl-}$.

b. spin – spin coupling in $\text{C}_2\text{H}_5\text{I}$.

c. How many signals would you expect for the protons in following compounds?

CH_3CHCl and CH_3COCH_3 .

5. Discuss the following:

3X5

a. Chemical shift.

b. Beer's Law

c. Discuss Blue shift with examples.

6. Answer the following;

3X5

a. CO molecule absorbs, while N_2 does not absorb in infrared region, explain.

b. Discuss the shifting of νCO vibration in acetaldehyde, when hydrogen of alkyl group is substituted by chlorine atom.

c. The $\nu\text{O-H}$ stretching vibrations appears as a broad band in concentrate solution, while in dilute solutions it shows a sharp band in I.R spectrum. Explain.

7. Discuss the following:

3X5

a. electronic transitions in organic compounds.

b. Calculate the wave number of a radiation whose wave length is 2.5μ .

c. Explain the principle of mass spectrometry.