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Roll No. | | | | | | | | | | | |

S. No. of Question Paper : **1856**

Unique Paper Code : **217677** **E**

Name of the Paper : **Paper : 24 : Pesticide Formulation and Analytical Techniques**

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

Semester : **VI**

Duration : **3 Hours** Maximum Marks : **75**

(Write your Roll No. on the top immediately on receipt of this question paper.)

Answer *five* questions out of the following.

All questions carry equal marks.

1. Answer the following : 10×1½

(*a*) Define parent ion peak in mass spectroscopy.

(*b*) What is the relation between wavelength and frequency ?

(*c*) What is excited single state ?

(*d*) Discuss reduced mass with proper formula.

(*e*) Which is more effective W.P. or E.C. ? Explain.

(*f*) Explain, n–σ^* transition.

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(*g*) Write the structural formula of TMS.

(*h*) What is chromophore ?

(*i*) When and why the molecules are I.R. active ?

(*j*) Give an example of Aerosol.

2. Discuss the following : 5×3

(*a*) n–π^* transition absorbs lesser energy than n–σ^*.

(*b*) π–π^* transition in UV spectrum with examples.

(*c*) The characteristic transition in CH_3OH and CH_3COCH_3 ?

(*d*) Effect of hydrogen bonding in the U.V. absorption.

(*e*) Blue shift with examples.

3. Answer the following : 5×3

(*a*) How would you explain the ν C = O vibrations in CH_3CHO, with H of aldehyde group is substituted by $-CH_3$ group ?

(*b*) Which vibration appears at higher frequency stretching or bending ? Explain with the help of figs.

(*c*) Which of the following absorbs at higher frequency for stretching vibration ? Explain :

O–H and N–H.

(*d*) What is the relation between absorbance and transmittance ?

(*e*) Arrange the following in decreasing order of energy :

n–σ^*, π–π^*, n–π^*, and σ–σ^*

4. Discuss the following : 5×3

(*a*) Position of methyl protons signals in CH_3–O–, CH_3–I–, and CH_3–Cl–.

(*b*) The spin-spin coupling in absolute C_2H_5OH

(*c*) The ^{1}Hnmr signals for the protons in the following compounds :

$(CH_3)_4Si$ and $CH_3C(Br_2)OH$.

(*d*) A compound with molecular formula C_3H_5OCl shows the following 1Hnmr signals :

(*i*) Triplet as s = 1.28 (3H)

(*ii*) Quartet at s = 3.40 (2H)

Give the structural formula.

(*e*) Depict the spin—spin coupling for CH_3CH_2 Cl protons.

5. Discuss the following : 5×3

(*a*) Auxochroms with examples

(*b*) The shifting in ν C = O vibration in CH_3COCH_3 when hydrogen of alkyl group is substituted by a chloro group.

(*c*) Micro capsulation

(*d*) Dehydro chlorination of DDT

(*e*) Chemical shift.

P.T.O.

6. Answer the following : 5×3

(*a*) CO molecule absorbs, while O_2 does not absorb in infrared region; explain.

(*b*) How can the IR spectra make distinction between intermolecular and intramolecular hydrogen bonding ?

(*c*) Amines show less change in ν N–H vibration on dilution than alcohol for ν O–H vibrations; explain.

(*d*) Discuss red shift with examples.

(*e*) Discuss the principle of mass spectrometry.

7. Discuss the following : 3×5

(*a*) Types of electronic transitions

(*b*) Lambert's law

(*c*) Role of inductive effect on proton signal positions with example.