1013

M.Sc. IV Sem. Main Examination 2020

CHEMISTRY

Paper - I

Applications of Spectroscopy

. M.M.: 85
Mini.Pass.Marks : 29

SECTION 'A'

1. Attempt any five . $5 \times 5 = 25$

(i) What do you understand by λ_{max} of a substance ?

(ii) What are suxochromes ?

(iii) What do you understand by 'Finger Print' region in IR spectroscopy ?

(iv) Discuss the effect of hydrogen bonding on vibrational frequencies in IR spectrum.

(v) What is spin spint coupling ?

(vi) Why C^{13} NMR is difficult to scan ?

(vii) What is fourier transform technique ?

Contd..

(viii) What is chemical shift ?

(ix) What are allowed and forbidden transitions ?

(x) Write main factors affecting fragmentation.

SECTION 'B'

(Long Answer Type Questions)

$12 \times 5 = 60$

Q. 2 Discuss various electronic transitions and origin of UV-visible spectra.

Or

Discuss fieser woodward rule for conjugated dienes with examples.

Q. 3 Write short notes on the following :

(i) Overtones

(ii) Combination Bands

(iii) Fermi resonance

Or

Discuss basic theory and molecular vibrations of IR spectroscopy.

Contd..

Q.4 Explain the theory and instrumentation of NMR spectroscopy.

Or

Write short notes on the following :

(i) Contact Shift

(ii) Pseudo contact shift

(iii) Shielding and de-shielding mechanism.

Q.5 What is C^{13} NMR spectroscopy ? How this technique differs from 1_H NMR spectroscopy ? Give examples.

Or

Write short notes on the following :

(i) COSY

(ii) DEPT

(iii) Inadequate technique.

Q.6 (i) Discuss general theory of mass spectroscopy.

(ii) Discuss metastable ions or peaks with examples.

Or

Contd..

Write short notes on the following :

(i) Nitrogen luide.

(ii) High resolution mass spectrometry.

(iii) Fragmentation pattern in mass spectroscopy.

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