

8211
M.Sc. CHEMISTRY IIIrd SEMESTER
EXAMINATION, 2019
Paper - I
Advanced Spectroscopic Techniques

Time: Three Hours

Maximum Marks: 80

PART – A (खण्ड – अ)

[Marks: 20]

Answer all questions (50 words each).

All questions carry equal marks.

सभी प्रश्न अनिवार्य हैं। प्रत्येक प्रश्न का उत्तर 50 शब्दों से अधिक न हो।

सभी प्रश्नों के अंक समान हैं।

PART – B (खण्ड – ब)

[Marks: 40]

Answer five questions (250 words each).

Selecting one from each unit. All questions carry equal marks.

प्रत्येक इकाई से एक-एक प्रश्न चुनते हुए, कुल पाँच प्रश्न कीजिए।

प्रत्येक प्रश्न का उत्तर 250 शब्दों से अधिक न हो।

सभी प्रश्नों के अंक समान हैं।

PART – C (खण्ड – स)

[Marks: 20]

Answer any two questions (300 words each).

All questions carry equal marks.

कोई दो प्रश्न कीजिए। प्रत्येक प्रश्न का उत्तर 300 शब्दों से अधिक न हो।

सभी प्रश्नों के अंक समान हैं।

PART – A

- Q.1 (i) Write Beer Lambert Law.
- (ii) What is Bathochromic Shift?
- (iii) Write name and chemical structure of TMS.
- (iv) What is Shift Reagent?
- (v) What is COSY technique?
- (vi) Name the best known free radical used in calibrating ESR spectra.
- (vii) Define Nitrogen Rule.
- (viii) What is Bass Peak?
- (ix) Write wave length of X – rays radiation.
- (x) Name the factor causing neutron diffraction.

PART – B

UNIT –I

- Q.2 What are the types of transitions in organic molecule.
- Q.3 In cyclic ketone $\nu_c = 0$ absorption increases as the size of the ring decreases. Why?
Give examples.

UNIT –II

- Q.4 Identify signals in NMR spectra of –
- (i) Methyl Ethyl ketone
- (ii) Ethyl bromide
- (iii) Methyl isopropyl ketone
- (iv) 2 – chloropropane

- Q.5 Explain Geminal coupling.

UNIT –III

Q.6 What is Broad Band or Noise Decoupling $^{13}\text{C}(^1\text{H})$ Spectra?

Q.7 Explain g Value and factor affecting ESR lines.

UNIT –IV

Q.8 Explain Fragmentation mode in primary alcohols.

Q.9 Describe Retro – Diels Alder Reaction.

UNIT –V

Q.10 Explain scattering intensity and scattering angle.

Q.11 What are Miller indices?

PART – C

Q.12 Explain factor affecting vibration frequencies.

Q.13 Explain spin – spin interaction in Proton NMR Spectroscopy.

Q.14 Explain Zero field Splitting and Kramer's Degeneracy.

Q.15 Explain McLafferty rearrangement with different examples.

Q.16 Explain Ramachandran diagram of proteins.
