

UKA TARSADIA UNIVERSITY
M. PHARM.(Pharma Analysis) SEMESTER – I January 2012
040060103 ADVANCED SPECTROSCOPIC TECHNIQUES

Maximum Marks 70

Instructions:

1. Attempt all questions.
2. Write each section in a separate answer book.
3. Make suitable assumptions wherever necessary.
4. Figures to the right indicate full marks.
5. Draw diagrams/figures whenever necessary.

Section I

- Q-1 (A) Answer the following** **[07]**
- i. Give the full form of followings:
a. LASER b. DEPT c. INADEQUQTE d. NOESY
 - ii. Enlist the types of LASER
 - iii. Name the detectors used in Photoacoustic spectrometry.
 - iv. Enlist useful Chemiluminescence reagents for solution phase assay.
- Q-1 (B) Answer the following in brief: (Any 4)** **[08]**
- I) What is the meaning of population inversion in LASER?
 - II) NIR laser sources used in Raman spectroscopy. Explain
 - III) What is stoke's and antistoke's shift?
 - IV) Monochromator is not required for light measurement in Chemiluminescence method.
 - V) DEPT experiment can be discriminated methyl, methylene, and methyne protons.
 - VI) The methyl group of the acetate moiety of ethyl acetate does not show off-diagonal peak.
- Q-2** **[10]**
- A) Describe mechanism of LASER formation.
- OR**
- A) What is Chemiluminescence? Describe theory of Chemiluminescence.
- B) Discuss principle of Photoacoustic spectrometry.
- OR**
- B) Describe COSY spectrum of 1-propanol.
- Q-3** **[10]**
- Write note on the followings: (Any 2)**
- A) Principle and instrumentation of Raman spectroscopy
 - B) HETCOR technique
 - C) Shifts reagents

Section-2

- Q-4 (A) Answer the following:** **[07]**
- I) Enlist the factors that affecting the CMR chemical shifts.
 - II) Enlist accelerators used as neutron source.
 - III) What do you mean by barns?
 - IV) What is the value of natural abundance of ^{13}C ?
 - V) What is the chemical shift value for carbon of acetylene in ^{13}C NMR
 - VI) Give the full form of PGNA and INNA.

Q-4 (B) Answer the following in brief: (Any 4) [08]

- I) Why in CMR protonless carbon is exhibit low intensity?
- II) Why benzene carbon is absorb at about δ 120 ppm in ^{13}C NMR?
- III) What is the role of quenching gas in GAS Ionization detector?
- IV) Differentiate between α , β and γ rays.
- V) Explain hyperfine splitting.
- VI) Give principle of INNA.

Q-5 Answer the following: [10]

- A) Describe proton decoupled and off resonance techniques used in ^{13}C NMR.

OR

- A) Predict proton coupled and decoupled ^{13}C NMR spectrum of Aspirin.

- B) Describe principle and instrumentation of Electron Spin resonance spectrometry.

OR

- B) Describe any two detectors used for radio activity measurement.

Q-6 Write note on the followings (Any 2) [10]

- A) Neutron activation analysis
- B) Positron emission tomography.
- C) Chemical shifts in ^{13}C NMR.
