

GUJARAT TECHNOLOGICAL UNIVERSITY
M. Pharm. – SEMESTER – I • EXAMINATION – SUMMER 2013

Subject Code: 910001**Date: 13-05-2013****Subject Name: Modern Analytical Techniques****Time: 10.30 am - 01.30 pm****Total Marks: 80****Instructions:**

1. Attempt any five questions.
2. Make suitable assumptions wherever necessary.
3. Figures to the right indicate full marks.

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| Q.1 | (a) Describe various methods used for simplification of complex NMR spectra. | 06 |
| | (b) Describe with diagram, principle and working of Michelson interferometer. | 05 |
| | (c) Predict the following compound (72 amu) on the basis of given data:
UV: λ_{max} 273 nm
IR : 2941-2855, 1715, 1460 cm^{-1}
NMR: 2.48 (q), 2.22 (s), 1.07 (t) | 05 |
| Q.2 | (a) Write short notes on: <ol style="list-style-type: none"> 1. Mc Lafferty rearrangement 2. ATR spectroscopy | 06 |
| | (b) What is isotopic abundance and explain various general rules for fragmentation in MS. | 05 |
| | (c) Explain in detail MALDI-MS. | 05 |
| Q.3 | (a) Explain NOE in detail. What are the problems in integration of C^{13} spectra. | 06 |
| | (b) Write a note on chiral stationary phases. | 05 |
| | (c) What is spin spin coupling? How many numbers of signals in the form of multiplet will appear in NMR spectra of propyl chloride and acetaldehyde? Also indicate the chemical shift value. | 05 |
| Q.4 | (a) Explain the principle of RIA and IRMA. Give differences between ELISA and EMIT. | 06 |
| | (b) What do you understand by positive and negative Cotton effect? Describe using suitable examples how ORD curves are helpful in conformational analysis. | 05 |
| | (c) Explain the similarities and differences between proton and carbon ^{13}NMR . | 05 |
| Q.5 | (a) Explain the principle and application of Inductively Coupled Plasma AES . | 06 |
| | (b) Describe theory and application of derivative spectroscopy. | 05 |
| | (c) Describe various thermal methods. Write a detailed note on DTA with applications. | 05 |
| Q. 6 | (a) Write a brief note on : <ol style="list-style-type: none"> 1. Reference standard 2. Affinity chromatography | 06 |
| | (b) Explain the principle and instrumentation of Supercritical Fluid Chromatography. | 05 |
| | (c) Explain the basic principle and applications of zone electrophoresis and iso-electric focusing. | 05 |
| Q. 7 | (a) Differentiate the following : 1. HPTLC and TLC 2. HPLC and GC | 06 |
| | (b) Explain Bragg's law and application of X-ray diffraction. | 05 |
| | (c) Explain in detail hyphenation technique, LC-MS. | 05 |
