

GUJARAT TECHNOLOGICAL UNIVERSITY**M. Pharm. – SEMESTER – I • EXAMINATION – SUMMER • 2014****Subject Code: 910001****Date: 20-05-2014****Subject Name: Modern Analytical Techniques****Time: 02:30 pm - 05:30 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) Define the terms: Spin-spin coupling, Base peak and Auxochrome. | 06 |
| | (b) Explain Bragg's law and application of X-ray diffraction. | 05 |
| | (c) Discuss derivative U V spectroscopy with applications | 05 |
| Q.2 | (a) Explain the principle of RIA and IRMA. Give differences between ELISA and EMIT. | 06 |
| | (b) Describe various methods used for simplification of complex NMR spectra. | 05 |
| | (c) Explain the terms of Van Demeter equation. Describe eddy and longitudinal diffusion in detail. | 05 |
| Q.3 | (a) Define the terms: Capacity factor, HETP and resolution. | 06 |
| | (b) What do you mean by frequency domain and time domain spectrum. Describe Michelson interferometer with diagram. | 05 |
| | (c) Write various applications of NIR spectroscopy. | 05 |
| Q.4 | (a) What is thermal method of analysis? Discuss principle and applications of differential thermal analysis (DTA). | 06 |
| | (b) Write in detail about affinity chromatography | 05 |
| | (c) Explain the basic principle and applications of zone electrophoresis and isoelectric focusing. | 05 |
| Q.5 | (a) Describe the factors affecting the chemical shift. | 06 |
| | (b) What is reflection spectroscopy? Describe attenuated total reflection (ATR) spectroscopy with its applications. | 05 |
| | (c) Discuss hydrogen decoupling and off resonance decoupling technique in CMR. | 05 |
| Q. 6 | (a) Describe the principle of atomic spectroscopy. Discuss atomization techniques used in atomic absorption spectroscopy. | 06 |
| | (b) Describe storage, handling and documentation of reference standard. | 05 |
| | (c) Describe chemical ionization technique with its advantages and disadvantages. | 05 |
| Q. 7 | (a) Discuss principle and stationary phases used in ion exchange chromatography. | 06 |
| | (b) Explain in detail about LC-MS. | 05 |
| | (c) Write principle, instrumentation and application of ORD. | 05 |
