GUJARAT TECHNOLOGICAL UNIVERSITY

M. Pharm. I[ST] Semester Examination – June- 2011
Subject code: 910001
Subject Name: Modern Analytical Techniques

Date:20/06/2011   **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.**

Q-1   **(a)** Comment on the following: **[06]**
       1) Para linked polyphenyl compound show bathochromic shift than meta linked.
       2) Chemically bonded silica gel is more selective than unmodified silica gel.
       3) Molar extinction coefficient is greater in CH_3I than CH_3Cl.

    (b) Calculate concentration in µg/ml of solution of drug A (mol wt – 204.2) in methanol, **[05]**
      giving absorbance at its λ max 277 nm, of 0.613 in a 4 cm cell.
      The molar absorptivity at 277 nm is 5432.

    (c) Explain the term: Fingerprint Region, Fermi resonance   **[05]**

Q-2   Write short note on following.   **[16]**

      a) GC-MS
      b) FT-IR
      c) Zone Electrophoresis

Q-3   a) Explain in detail Fast Atom Bombardment MS   **[06]**
    b) Explain the principle of Optical Rotary Dispersion   **[05]**
    c) Explain the principle and instrumentation of Super Fluid Chromatography **[05]**

Q-4   a) Explain in detail Stationary phase in Gas Chromatography.   **[06]**
    b) Describe factors influencing the value of coupling constant.   **[05]**
    c) Explain Solvent interference and Ionization interference.   **[05]**

Q-5   a) Explain Enzyme immuno assay- ELISA   **[06]**
    b) Write a note on Attenuated Total Reflectance.   **[05]**
    c) Explain the Derivative spectroscopy   **[05]**

Q-6   a) Write the Principle and instrumentation of Differential Scanning Calorimetry **[06]**
    b) Discuss in detail Flame Ionization Detector.   **[05]**
    c) Explain the principle and application of Inductive Couple Plasma – AES. **[05]**

Q-7 a) Identify the following compounds on the basis of the spectral data presented here. Show your reasoning for the conclusion arrived at. **[06]**
UV: 243 and 280 nm
IR: 3300, 3000+, 3000, 1670, 1650, 1510 cm-1
NMR: 1.3 (3H), 2.1 (3H), 4.0 (2H), 6.8, 7.3 d (4H), 7.6 (1H)
CMR: 14.8, 24.2, 63.7, 114.7, 122.0, 131.0, 155.8, 168.5
MS: M+ 179, 137, 43, 27 and 29, 108/109

b) Write a note on C13 NMR. **[05]**

c) Explain Bragg's law and application of X-ray diffraction. **[05]**

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