Seat No.: _____ Enrolment No._____

GUJARAT TECHNOLOGICAL UNIVERSITY

B. Pharm-Semester-VII May-2012 Examination

Subject code: 270004

Subject Name: Pharmaceutical Analysis III

Time: 02:30pm to 5:30pm **Date:28 -05-2012**

Instructions: **Total Marks: 80**

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

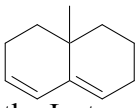
Q.1 (a) Define Lambert-Beer Law. Discuss the construction and principle of double Beam spectrophotometer. **06**

(b) Discuss the wave Properties of Electromagnetic radiation. **05**

(c) Calculate concentration in µg/ml of drug (Mol.Wt-204.2) in 1m HCl, giving absorbance of 0.613 in 4 cm cell of λ_{max} value of 277nm, the Molar absorptivity Value is 5432 at 277nm. **05**

Q.2 (a) Define Phosphorescence. Discuss the factor influencing Fluorescence intensity. **06**

(b) The observed value of $\lambda_{max\ of}$ the following compound is 234nm. Explain. **05**



(c) Write down the Instrumentation and application of Fluorescence spectroscopy **05**

Q.3 (a) What do you mean by Molecular vibration in IR. Discuss the factors influencing Vibrational frequencies. **06**

(b) Calculate stretching frequency of C-H in alkane by Hook's law. ($k=5X10^5$ dynes/cm) **05**

(c) Give the difference between Dispersive IR and FTIR. **05**

Q.4 (a) Explain the basic principle of atomic spectroscopy. Give the difference between the atomic absorption and atomic emission spectroscopy. **06**

(b) Discuss about the interferences in AAS **05**

(c) Write down the Application of Atomic absorption Spectroscopy. **05**

Q.5 (a) What is mass spectroscopy? Enlist the ionization techniques used in MS. Explain Chemical ionization technique in detail. **06**

(b) Why isotope peaks are present in mass spectrum of a compound? **05**

(c) write short notes on any two **05**

(i) Mc-Lafferty rearrangement

(ii) Base Peak

(iii) Metastable ion

Q. 6 (a) What do you mean by chemical Shift? Describe the factors affecting the chemical Shift. **06**

(b) Discuss the Principle and instrumentation of NMR spectroscopy **05**

(c) Why carbon-13 NMR spectra more difficult to record than H-NMR. Write short Note on spin-spin coupling. **05**

Q.7 Identify the following compounds on the basis of the spectral data presented here.show your reasoning for the conclusion arrived at. **16**

(i) Molecular weight: 108 amu

UV : λ_{max} 253 nm
IR: $3401_{(s)}$, $3077_{(s)}$, $2899_{(m)}$, $1499_{(b)}$, $1456_{(m)}$,$690\text{-}710_{(s)}$ cm^{-1}
NMR: singlet δ =7.2(5H)
Singlet δ=4.5(2H)
Singlet δ=2.8(1H)

(ii) Molecular weight: 72 amu

UV : λ_{max} 272 nm
IR: $2941\text{-}2857_{(m)}$, $1716_{(s)}$, $1460_{(m)}$ cm^{-1}
NMR: quartet δ =2.48(2H)
Singlet δ=2.22(3H)
triplet δ=1.07(3H)