

**GUJARAT TECHNOLOGICAL UNIVERSITY**  
**B. Pharm. – SEMESTER – VII • EXAMINATION – SUMMER • 2015**

**Subject Code: 270004****Date: 14-05-2015****Subject Name: Pharmaceutical Analysis-III****Time: 02:30 pm to 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.

- Q.1** (a) Comment on followings statement with explanation. **10**  
 (i) Molecular UV absorption spectra are continuous spectra.  
 (ii) Nitrogen & hydrogen gases do not absorb IR radiation.  
 (iii) Fluorescence is observed at shorter wavelength than that of excitation.  
 (iv) In IR spectra of Acetone weak band is observed at  $3430\text{ cm}^{-1}$ .  
 (v) Index of hydrogen deficiency in  $\text{C}_6\text{H}_5\text{CHO}$  is 4.
- (b) A solution containing  $20\text{ }\mu\text{g/ml}$  of drug (M.Wt 100), in 1 cm cell gave absorbance 0.4 at 257 nm, calculate molar absorptivity of the drug at 257 nm. **06**
- Q.2** (a) Explain concept, types and characteristics of electronic transitions involved in absorption of UV-VIS radiation. **06**  
 (b) State Beer's and Lambert's Law of photometry and derive  $A = abc$ . **05**  
 (c) Write note on a detector used in a modern uv-vis spectrophotometer. **05**
- Q.3** (a) Discuss the factors affecting fluorescence intensity. **06**  
 (b) Write a note on plasma emission spectroscopy. **05**  
 (c) Discuss the interference in Atomic Absorption Spectroscopy. **05**
- Q.4** (a) Discuss theory of IR spectroscopy. **10**  
 (b) Write note on FT-IR spectrophotometer. **06**
- Q.5** (a) Explain working of  $^1\text{H}$ NMR spectrometer. **06**  
 (b) What is  $\delta$  scale of chemical shift in  $^1\text{H}$ NMR? Discuss factor affecting chemical shift. **05**  
 (c) What is spin-spin coupling? Explain Spin-spin coupling in Ethanol. **05**
- Q. 6** (a) Enumerate techniques of ionization used in mass spectroscopy. Discuss any one. **06**  
 (b) Explain working principle of Mass spectrometer with labeled diagram. **05**  
 (c) Explain significance of following terms in mass spectroscopy; **05**  
 Molecular Ion peak, Base Peak, M+1 peak, M+H peak, Nitrogen rule.
- Q.7** (a) Deduce structure of compound with following spectral details. **06**  
 Mol. Formula :  $\text{C}_{10}\text{H}_{12}\text{O}$   
 UV:  $\lambda_{\text{max}} 238\text{ nm(S)}$   
 IR:  $3010, 2950, 1700\text{ cm}^{-1}$   
 NMR  $\delta$  0.95 triplet (3H)  
           1.8 sextet (2H)  
           2.75 Triplet (2H)  
           8.2-7.4 Multiplet (5H)
- (b) Discuss sample preparation in IR spectroscopy. **05**  
 (c) Write a short note on hollow cathode lamp. **05**