Seat No.: _____ *Enrolment No._____*

GUJARAT TECHNOLOGICAL UNIVERSITY

M. Pharmacy Sem-I Remedial Examination April 2010

Subject code: 910001

Subject Name: Modern Analytical Techniques

Date:05 / 04 / 2010 **Time: 12.00 noon – 03.00 pm**

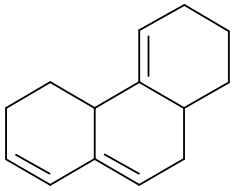
Total Marks: 80

Instructions:

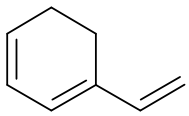
1. **Attempt any five questions.**
2. **Make suitable assumptions wherever necessary.**
3. **Figures to the right indicate full marks.**

Q.1	**(a)**	Explain the principle of mass spectroscopy. Describe Time of Flight analyzer with diagram.	**06**
	(b)	Describe field desorption and MALDI techniques in detail.	**05**
	(c)	Discuss with suitable examples McLafferty rearrangement.	**05**
Q.2	**(a)**	Calculate λ_{max} for the following :	**06**

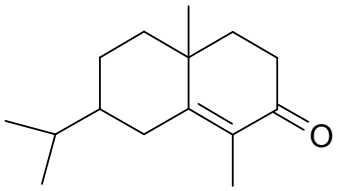
(a)



(b)



(c)



	(b)	Explain difference spectrophotometry and derivative spectrophotometry.	**05**
	(c)	Discuss the importance of derivatization in Gas Chromatography.	**05**
Q.3	**(a)**	Explain the principle of NMR spectroscopy. Explain briefly the terms : chemical shift, spin-spin coupling and coupling constant.	**06**
	(b)	What do you mean by 2D-NMR? Discuss the applications of 2D-NMR in pharmacy.	**05**
	(c)	Identify the compound on the basis of spectral data presented below and show the reasoning for the same. Molecular formula : $C_8H_{11}NO$ IR (cm^{-1}) 3000, 1650, 1540, 1240, 1120, 850 ^1H NMR (delta) : 1.3 triplet (3H) 3.25 singlet (2H) 3.95 quartet (2H) 6.6 multiplet (4H)	**05**

Q.4	**(a)**	How will you differentiate the following pair of compounds using IR spectroscopy? Give appropriate wavenumber for prominent peaks. i) Acetonitrile and acetamide ii) Ortho and para hydroxy benzoic acid iii) Phenyl acetate and methyl benzoate	**06**
	(b)	Explain the principle of FTIR and discuss Michelson interferometer along with diagram.	**05**
	(c)	Discuss the technique used in ^{13}C NMR.	**05**
Q.5	**(a)**	Explain the thermal methods of analysis. Discuss the principle and applications of DSC.	**06**
	(b)	Discuss moving boundary electrophoresis and zone electrophoresis.	**05**
	(c)	What is the basic principle underlying Atomic Absorption Spectroscopy? Describe the background interferences present in Atomic Absorption Spectroscopy.	**05**
Q. 6	**(a)**	Explain the principle of HPLC analysis. Discuss the factors responsible for band broadening in column chromatography.	**06**
	(b)	Describe the principle and technique of affinity chromatography.	**05**
	(c)	Write a note on supercritical fluid chromatography.	**05**
Q.7	**(a)**	Explain the principle and applications of Optical Rotatory Dispersion.	**06**
	(b)	Describe competitive and double sandwich ELISA techniques for antigen measurement.	**05**
	(c)	What do you understand by the term 'X-ray diffraction'? Explain Bragg's law.	**05**

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