Seat No.: _____ Enrolment No.____

GUJARAT TECHNOLOGICAL UNIVERSITY M. PHARM. - SEMESTER - I • EXAMINATION - WINTER 2012

Subject code: 910001 Subject Name: Modern Analytical Techniques Time: 10.30 am - 01.30pm Total Marks: 8 Instructions: 1. Attempt any five questions. 2. Make suitable assumptions wherever necessary. 3. Figures to the right indicate full marks.			1/2013	
			80	
Q.1	(a) (b) (c)	What do you means by frequency domain and time domain spectrum. Describe Michaelson interferometer with diagram. Explain in brief Derivative UV spectroscopy with its application. What do you mean by Radio Immuno Assay? Discuss principle and method used in ELISA technique.	06 05 05	
Q.2	(a)	Calculate the λ_{max} of following compounds	06	
	(b) (c)	(i) (ii) (iii) How can you differentiate following pair of compounds using IR spectroscopy? i. Acetone and acetylene ii. Acetaldehyde and methanol Describe storage, handling and documentation of reference standard.	05	
Q.3	(a) (b) (c)	Enumerate factors responsible for the band broadening in chromatographic column. Discuss Eddy and Longitudinal diffusion. Explain the term capacity factor, tailing factor and resolution. Describe the principle and technique of Ion exchange chromatography.	06 05 05	
Q.4	(a) (b) (c)	What is chemical shift? Discuss the factors affecting chemical shift. Describe hydrogen decoupling and off resonance decoupling technique in CMR. How can you differentiate isomer of trichloro benzene on the basis of their proton decouple CMR spectra?	06 05 05	
Q.5	(a) (b)	Discuss principle, instrumentation and application of Differential Scanning Calorimetry (DSC). What do you mean by X-ray powder diffraction? Explain Bragg's law. Discuss anticel rotatory dispersion (ORD) and circular	06 05	
	(c)	Discuss optical rotatory dispersion (ORD) and circular dichroism(CD).	05	

Enlist the ionization techniques used in mass spectroscopy. Discuss **06** Q. 6 MALDI technique. How can you differentiate the isomer of pentanol using mass 05 (b) spectroscopy? Discuss isoelectric focusing technique. **05** (c) **Q.7** What is plasma? Describe inductive coupled plasma emission **06** (a) spectroscopy. (b) Identify the compound on the basis of spectral data presented below 05 and show the reason for the same UV (nm) : 280 IR (cm⁻¹) : 3400, 3050, 2980, 1600, 1500, 1420, 1300, 750, 700 NMR (δ) : 1.2 Triplet (3H) 3.1 Quartet (2H) 3.3 Singlet (1H) 6.5-7.5 multiplet (5H) Mass(m/e) : M⁺ 121 Identify the compound on the basis of spectral data presented below (c) and show the reason for the same UV (nm) : below 220 IR (cm⁻¹) : 3500, 3400, 1680, 1400 NMR (δ) : 1.2 Triplet (3H) 2.25 Quartet (2H) 6.5 broad singlet (2H)

: 73, 57, 55, 44 (base), 29

Mass(m/e)