Seat No.: _____ Enrolment No._____

GUJARAT TECHNOLOGICAL UNIVERSITY

M. PHARM. - SEMESTER – I • EXAMINATION – WINTER 2012

Subject code: 910207 **Date: 11/01/2013**

Subject Name: Advanced Spectroscopic Techniques

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)	What is chemiluminescence? Describe its principle. Give applications of chemiluminescence.	**08**
	(b)	Describe the instrumentation of chemiluminescence.	**08**
Q.2	(a)	Explain the term LASER. Discuss the mechanism of LASER formation.	**08**
	(b)	Classify LASER. Describe gas and dye LASER.	**08**
Q.3	(a)	What is Raman spectroscopy? Describe mechanism of Raman and Rayleigh scattering.	**08**
	(b)	Describe sources and sample illumination system used in Raman spectrometers.	**08**
Q.4	(a)	What are neutron activation methods? Discuss neutron and neutron sources. Give application of neutron activation methods.	**08**
	(b)	Describe principle, technique and application of isotopic dilution method.	**08**
Q.5	(a)	Explain principle of photoacoustic spectroscopy. Describe detectors and sample cell used in photoacoustic spectroscopy.	**10**
	(b)	Describe theory of electron spin resonance spectrometry.	**06**
Q. 6	(a)	What do you mean by two dimensional NMR spectroscopy? Describe COSY and HETCOR technique with suitable examples.	**10**
	(b)	Describe the effect of electronegative atoms and hybridization on chemical shifts in ^{13}C NMR.	**06**
Q.7		Write note on the followings;	**16**
	(a)	DEPT Technique	
	(b)	Positron emission tomography (PET)	
	(c)	Deuterium substitution in ^{13}C NMR.	

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