GUJARAT TECHNOLOGICAL UNIVERSITY
M. Pharmacy Sem-I Regular / Remedial Examination January/February 2011

Subject code: 910207
Subject Name: Advanced Spectroscopic Techniques

Date:03/02 /2011   **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? Write theory of Chemiluminescence.	06
	(b)	Discuss the apparatus used for Chemiluminescent quantitative analysis.	05
	(c)	Discuss the theory of Electron spin resonance spectrometry in brief.	05
Q.2	(a)	Write note on: Instrumentation of Electron spin resonanace spectrometry.	06
	(b)	Discuss principle of Photoacoustic spectrometry.	05
	(c)	Describe the sample cell and detectors used in Photoacoustic spectroscopy.	05
Q.3	(a)	What is Laser? Explain principle involved in it.	06
	(b)	Give Comparision of Raman spectroscopy and Infra red spectroscopy.	05
	(c)	Expalin proton decoupling technique used in ^{13}C NMR.	05
Q.4	(a)	Explain principle and instrumentation of Raman spectroscopy.	06
	(b)	Give an account of deuterium substitution used in ^{13}C NMR.	05
	(c)	What is coupling constant? Explain long range coupling in detail.	05
Q.5	(a)	Write a note on Chemical shift observed in ^{13}C NMR.	06
	(b)	Explain basic difference between proton NMR and ^{13}C NMR.	05
	(c)	Write a note on (A) Population inversion and (B) Pumping mechanism in Laser.	05
Q. 6	(a)	Discuss pulse sequence used in gated decoupling spectrum and inverse gated decoupling spectrum.	06
	(b)	Describe DEPT technique in detail.	05
	(c)	Write a note on Nuclear overhauser effect.	05
Q.7	(a)	Discuss HETCOR technique in detail.	06
	(b)	Describe COSY spectrum of 2-Nitropropane.	05
	(c)	Write an explanatory note on molecular relaxation processes in NMR.	05

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