

GUJARAT TECHNOLOGICAL UNIVERSITY**M. Pharm. – SEMESTER – I • EXAMINATION – SUMMER • 2015****Subject Code: 910207****Date: 25-05-2015****Subject Name: Advanced Spectroscopic Techniques****Time: 02:30 pm - 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.**

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| Q.1 | (a) Define chemiluminescence and discuss its basic principle. | 06 |
| | (b) Write a note on instrumentation LASER. | 05 |
| | (c) Explain in detail liquid phase chemiluminescence. | 05 |
| Q.2 | (a) Draw the schematic diagram and discuss apparatus used in chemiluminescence. | 06 |
| | (b) Define Electron spin resonance and discuss theory of Electron spin resonance. | 05 |
| | (c) Explain factor affecting of the g-value. | 05 |
| Q.3 | (a) Discuss source of electromagnetic radiation and source of magnetic flux density for electron spin resonance. | 06 |
| | (b) Give the differences between NMR and ESR. | 05 |
| | (c) Describe applications of electron spin resonance. | 05 |
| Q.4 | (a) What is Raman spectroscopy? Discuss the different types of raman spectra and its principle. | 06 |
| | (b) Write in depth on isotopic dilution. | 05 |
| | (c) Discuss applications and limitations of photoacoustic spectroscopy. | 05 |
| Q.5 | (a) Explain in detail neutron activation methods with suitable examples. | 06 |
| | (b) Write a note on positron emission tomography. | 05 |
| | (c) Give note on shift reagent used in NMR. | 05 |
| Q. 6 | (a) Write brief note on 2D NMR. | 06 |
| | (b) Discuss APT technique in NMR. | 05 |
| | (c) Give the comparison between ¹³ C NMR and Proton NMR. | 05 |
| Q.7 | (a) Discuss proton coupled and proton decoupled spectra in ¹³ C NMR. | 06 |
| | (b) Give the applications of Raman spectroscopy. | 05 |
| | (c) Explain in detail instrumentation of photoacoustic spectroscopy. | 05 |
