

GUJARAT TECHNOLOGICAL UNIVERSITY
M. Pharm - SEMESTER-I • EXAMINATION – WINTER-2016

Subject Code: 910207**Date: 04/01/2017****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 LASER? Discuss mechanism of LASER formation. Give remarkable properties of LASER. **06**
- (b) Discuss different types of luminescence. Write principle of chemiluminescence. **05**
- (c) Discuss Nuclear Overhauser effect spectroscopy technique. **05**
- Q.2** (a) What is Raman spectroscopy? Discuss principle of Raman spectroscopy. Write advantages, disadvantages of Raman Spectroscopy. **06**
- (b) Write a comparative note on Raman spectroscopy and Infrared spectroscopy. **05**
- (c) How ^{13}C NMR differs from ^1H NMR? **05**
- Q.3** (a) What is two dimensional NMR? Write a note on COSY technique using suitable illustrations. **06**
- (b) Discuss Nuclear overhauser effect and Off resonance decoupling with respect to ^{13}C NMR. **05**
- (c) Give the differences between NMR and ESR. **05**
- Q.4** (a) Explain in detail liquid phase chemiluminescence. **06**
- (b) Discuss the application of Photoacoustic spectroscopy. **05**
- (c) Write in depth on isotopic dilution. **05**
- Q.5** (a) Describe theory, instrumentation and applications of Electron Spin resonance spectrometry. **06**
- (b) Describe COSY spectrum of 2-propanol. **05**
- (c) Discuss the spin-spin coupling in ^{13}C NMR. **05**
- Q. 6** (a) Explain in detail factors affecting chemical shift in NMR. **06**
- (b) Discuss applications of chemiluminescence. **05**
- (c) Write a note on light sources and detectors used in photoacoustic spectroscopy. **05**
- Q.7** (a) Discuss source of electromagnetic radiation and source of magnetic flux density for electron spin resonance. **06**
- (b) Discuss APT technique in NMR. **05**
- (c) Write note on Neutron activation method. **05**
