Roll No .....

MPY - 101

M.Pharmacy I Semester

Examination, December 2015

Modern Analytical Technique

Time : Three Hours

Maximum Marks : 70

Note: i) Attempt five questions in all including.
ii) Question no. 1 which is compulsory.

1. a) Which of the following molecules exhibit IR spectra :
   i) H_2 ii) N_2 iii) O_2
   iv) Cl_2 v) NO vi) CO
   b) Why is absorption of gases in for infrared region characterized by discrete well defined lines?
   c) What is the essential condition for Raman shift in scattering?
   d) Which structural features may produce a bathochromic shift and hyprochromic shift in an organic compound?
   e) Why is methanol a good solvent in UV spectrophotometry?
   f) Why is fluorimetry less widely used and applicable than absorption methods?
   g) Write limitations of ESR.
   h) Why do compounds containing a hydrogen atom at the position gamma to a carbonyl group show a relatively intense peak with an even m/e value?
   i) Why 12_C, 16_O, 18_O, 32_S do not show NMR spectra?
   j) What is the main difference between atomic absorption spectroscopy and flame emission spectroscopy?

2. a) Give principle of Atomic absorption spectroscopy.
   b) What is RIA technique? Explain various RIA methods and their applications in pharmaceutical research and development.

3. a) Name different ionization techniques in mass spectrometry.
   b) Give labeled diagram of mass spectrometer.
   c) Explain McLatterty Rule giving example.

4. a) Explain theory of proton NMR spectroscopy.
   b) Discuss shielding and deshielding effect giving example.
   c) Explain splitting of signals and spin-spin coupling.

5. a) Explain various types of electronic transitions in UV-visible spectrophotometry.
   b) Give labeled diagram for instrument of spectrofluorometer. Discuss its theory and applications.

6. a) Discuss column packing, pumping system and detector system used in HPLC.
   b) Sketch components of gas chromatography and explain HETP in connection with continuous flow separation process such as gas-liquid chromatography.

7. a) Discuss how vibrational coupling, π cloud integration, inductive and mesomeric effects influence, vibrational frequencies in IR spectroscopy.
   b) Write on advantages and disadvantages of Raman spectroscopy over IR spectroscopy.
   c) Explain why instrumentation for ESR is quite different from that of NMR spectrometry.

8. a) What do you understand by DTA? Illustrate with an example complementary relationship of TGA and DTA.
   b) Compare ORD and CD Techniques.
   c) Discuss applications of electron diffraction method and its advantages over X - ray methods.

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