

**MPY-101**

**M. Pharm. (First Semester)**

**EXAMINATION, Jan., 2009**

**MODERN ANALYTICAL TECHNIQUES**

**(MPY – 101)**

*Time : Three Hours*

*Maximum Marks : 75*

**Note :** Attempt any *five* questions. All questions carry equal marks.

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Discuss the following :

- (i) Any *two* detectors used in GLC
- (ii) HETP and its significance
- (iii) Band broadening in GLC and factors responsible for it

2. (a) Explain the following statements :

- (i) Atomic absorption spectroscopy is one of the best analytical methods for quantitative estimation of trace metals.
- (ii) AAS facilitates estimation of a specific element in presence of other elements accurately and precisely.
- (b) (i) Describe a major advantage of micellar electrokinetic capillary chromatography over conventional liquid chromatography.
- (ii) Explain why spectrofluorometry is potentially more sensitive than spectrophotometry.

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3. (a) Discuss how electronegativity and anisotropic effect influence chemical shift ?
- (b) Explain how geminal, vicinal, trans and aromatic coupling influence coupling constant 'J'. Discuss its significance in structure elucidation.
4. (a) Explain broad band decoupling and off resonance decoupling and its influence in  $^{13}\text{C}$  NMR.
- (b) What are spin-spin and spin-lattice relaxations ? Explain their role in structure elucidation.
5. Exercise any *three* of the following :
- (a) Explain the term ELISA. Discuss assay for antibody by this method. RGPVonline.com
- (b) What is flow cytometry ? Give schematic representatives on the instrument and discuss applications.
- (c) Discuss the principle of RIA. Explain procedure for assay of steroid hormone by above methods.
- (d) What is scintillation ? What types of scintillation counting are available ? Discuss liquid scintillation counting.
6. Write on any *three* of the following :
- (a) Principle and procedure of a spectroscopic technique to study reaction mechanism involving free radical intermediates and transition metal containing metalloproteins.
- (b) Spectroscopic method to estimate trace metals in biological fluids.
- (c) Discuss principle and procedure theory of fluorimetry. How would you assay enzymes by this method ?
- (d) Explain X-ray diffraction. Give line diagram and mention its pharmaceutical applications.

7. Elaborate on any *three* of the following :
- (a) Types of electronic transitions and their region in electronic spectra.
- (b) Fermi resonance, overtones and combination bands. Their role in structure elucidation.
- (c) Effect of chromophore, auxochrome and solvent change on  $\lambda$ -max.
- (d) Frequency shift due to inductive and mesomeric effect. Implication and structure determination.
8. Discuss any *three* of the following :
- (a) Index of hydrogen deficiency and nitrogen rule. Importance in structure elucidation.
- (b) Isotopic abundance and its role in empirical formula.
- (c) Mc Laffery rearrangement and its significance.
- (d) Ionization techniques in mass spectrometry and their selectivity.