MPY–101

M. Pharm. (First Semester)
EXAMINATION, Jan.-Feb., 2008
MODERN ANALYTICAL TECHNIQUES
(MPY–101)

Time : Three Hours

Maximum Marks : 75

Minimum Pass Marks : 38

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

1. (a) Draw a line diagram of a mass spectrometer and explain its working.
   (b) What are M + 1 and M + 2 peaks ? Write their importance in structure elucidation.
   (c) Write a note on nitrogen rule and Mc Lafferty arrangement.
2. (a) What is chemical shift ? Comment on the factors that affect the chemical shifts.
   (b) What are chemically equivalent but magnetically non-equivalent protons ?
   (c) What is Nuclear Overhausser effect ? Where is it observed ?
   (d) How can *n*-butanol, 2-butanol, t-butyl alcohol and iso-butyl alcohol differentiated on the basis of ^{13}C-NMR ?

Discuss the following :

(i) HETP and its significance

(ii) Band broadening in GLC and factors responsible for it.

(iii) Name the detectors used in GLC. Discuss any *two* in detail.

(iv) Merits and demerits of HPLC over GLC and applications.

4. Explain the following statements with respect to atomic absorption spectroscopy :

(i) One of the best analytical methods for quantitative estimation of trace metals.

(ii) AAS may be accomplished either by electro-chemical device or by flame.

(iii) AAS facilitates estimation of a specific element in the presence of other elements accurately and precisely.

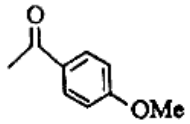
(iv) Merits of AAS over FES.

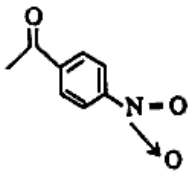
(v) Demerits of AAS.

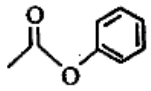
5. (a) How can you distinguish among *n*-Hexane, 1-Hexane and 1-Hexyne on the basis of IR.

(b) In IR C = O stretching absorption occurs at 1700 cm^{-1}. Discuss the reasons for the variation in C = O stretching absorption in the following structures.

(i) 

(ii) 

(iii) 

(iv) 

(c) Compare the IR peaks which differentiates between the following :

(i) amides and acids

(ii) esters and acids

(iii) alcohols and phenols

6. Write exhaustive notes on any *two* of the following :

(i) Ion pair chromatography

(ii) Differential thermal analysis

(iii) Liquid scintillation spectrometry

7. What is RIA ? Discuss the various steps that are sequentially adopted in the methodology of RIA. Discuss its applications.

8. Discuss the principle, instrumentaion and applications of ORD and also comment on CD.