Question Paper

MANIPAL ACADEMY OF HIGHER EDUCATION

Manipal Academy of Higher Education, Manipal MPharm Theory End-Semester Examinations.

Advanced Instrumental Analysis [PCH-MPA201T -S1]

Marks: 75   **Duration: 180 mins.**

SECTION - A

Answer all the questions.

Answer the following (10 marks x 5 = 50 marks)

1)	1A. Explain with suitable example the identification of carbonyl compounds using Infra-red spectrum. 5 M 1B. Explain the medicinal and pharmaceutical applications of near-IR. 5 M	(10)
2)	2A Explain in detail the fragmentation rules in electron impact mass spectroscopy give suitable example. 7 M 2B. How isotopic ion peaks in mass spectral data are recognised? Explain. 3 M	(10)
3)	3. Explain the fragmentation pattern of amines and alcohol in electron impact ionization technique. 10 M	(10)
4)	4A. List out the HETCOR techniques. And explain any two of them. (2.5 M x 2) 4B. What is Chemical Shift? Explain the factors effecting the chemical shift values. (1M + 4 M)	(10)
5)	5A. What is the advantage of using 2D NMR over 1D NMR? How does 2D NMR differ from 1D NMR? How are cross-peaks interpreted in a 2D NMR spectrum? (2 M+1 M+2 M) 5B. I. How many non-equivalent hydrogens are there in the following molecules; how many signals will you see of 1H in NMR spectrum: (2.5 M x 2) CH3CH2CH2Br b) CH3OCH2C(CH3)3 c) Ethyl Benzene d) 2-methyl-1-hexane II. A NMR spectrum of 1,1-dichloroethane, is collected in a 30 MHz instrument. This compound has coupling between A (the quartet at 6 ppm) and B (the doublet at 2 ppm). i). The peaks for A are at 6.2, 6.0, 5.8, and 5.6 ppm. ii). The peaks at B are at 2.0 and 2.2 ppm. iii). Calculate the J value for A and B.	(10)

SECTION - B

Answer all the questions.

Answer the following (5 marks x 5 = 25 marks)

6)	Explain the Woodward Fieser rules for unsaturated carbonyl compounds.	(5)
7)	Explain different derivatisation techniques in GC.	(5)
8)	Write a note on immobilised polysaccharides as chiral stationary phase.	(5)
9)	Discuss the principle and instrumentation of LC-MS.	(5)
10)	Briefly write on flash chromatography	(5)

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