Question Paper

Exam Date & Time: 13-May-2024 (02:00 PM - 05:00 PM)

MANIPAL ACADEMY OF HIGHER EDUCATION

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

Advanced Instrumental Analysis [PCH-MPA201T -S3]

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

SECTION - A

Answer all the questions.

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

1)		Discuss with examples the inductive cleavage	(5)
	A)		
	B)	Discuss about fragmentation pattern of aromatic compounds and alkanes with example	(5)
2)		Why C=O vibrational frequency shifts from its normal value? How do you differentiate the following from IR spectra? a. Benzoic acid and Benzaldehyde b. Phenol and ethyl alcohol	(6)
	A)		
	B)	Explain the principle and applications of ATR-IR	(4)
3)		Outline the instrumentation and applications of Flash chromatography technique. Enlist and interpret properties of HPLC solvents. (6 + 4 marks)	(10)
4)		Discuss the basic principle and applications involved in ion-exchange chromatography. Summarize the advantages of LC over GC. (6+4)	(10)
5)		Describe the factors affecting the chemical shift in 1H NMR spectrum.	(5)
	A)		
	B)	Explain HETCOR & NOESY NMR spectrum with suitable examples.	(5)

SECTION - B

Answer all the questions.

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

6)	Explain the factors that influence ion abundance	(5)
7)	Explain the applications of mass spectrometry	(5)
8)	Provide the δ values for 1H and 13 C NMR of the following compounds: a) methyl ethyl ketone b) benzaldehyde	(5)
9)	Discuss the COSY technique in 2D NMR with an example.	(5)
10)	Explain with the suitable examples the Woodward Fieser rules for Conjugated Dienes.	(5)

-----End-----