C. U. SHAH UNIVERSITY

M. Sc. Analytical Chemistry
Semester – IV Examination
Date: 23-05-2015   day   Time: 10:30 am - 1:30 pm
Subject: 5SC04ACC3 - Advanced Analytical Instrumentation
Note: Attempt all questions.   Maximum Marks – 70
Figures to the right indicate marks.

SECTION: I

Q.1	(a)	Classify Liquid Chromatography	[01]
	(b)	Give the advantage and disadvantage of Double-Focusing Magnetic Sector	[01]
	(c)	Write Van Deemter equation for UPLC.	[01]
	(d)	What are the basic components of a mass spectrometer?	[01]
	(e)	Enlist applications of mass spectrometry?	[01]
	(f)	Which are the Matrices used in MALDI analysis?	[01]
	(g)	What is a supercritical fluid?	[01]
Q.2	(a)	What is MALDI? How does it differ from ESI? Outline on a step by step basis how it works?	[05]
	(b)	Write a note on Tandem Mass Spectroscopy as MS/MS analyzer	[05]
	(c)	Write a note on FTICR as MS/MS analyzer	[04]

OR

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Q.2	(a)	What is mass analyzer? Which mass analyzer is most suitable for MALDI ion source? Explain it in details.	[05]
	(b)	What is soft ionization? Mention two soft ionization methods.	[05]
	(c)	Basic types of Ion sources for organic mass spectrometry	[04]
Q.3	(a)	Write brief notes on Detectors used in UPLC	[08]
	(b)	Distinguish between HPLC and UPLC	[06]

OR

Q.3	(a)	Write brief notes on Supercritical Fluid Chromatography	[08]
	(b)	Give the advantage, disadvantage and applications of UPLC.	[06]

SECTION: II

Q.4	(a)	Why Liquid Chromatography used in hyphenated MS technique (LC-MS)?	[01]
	(b)	What is a mass spectrometer?	[01]
	(c)	Write basic principle of LCMS	[01]
	(d)	Why use ions in ICPMS technique?	[01]
	(e)	What is chromatography?	[01]
	(f)	How many signal observed in NMR techniques	[02]

I. H_3C—CH—CH_3 (with Cl on the CH)   II.
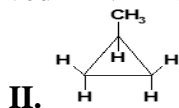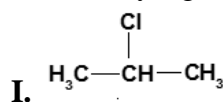
Q.5	**(a)**	Write brief note on ICP-MS.	[07]
	(b)	How are the isotopes separated in ICP-MS?	[04]
	(c)	Distinguish between ICP-MS and LA-ICP-MS by giving one examples.	[03]

OR

Q.5	**(a)**	Distinguish between ICP-MS, ICP-AES and AAS	[06]
	(b)	What are the crucial steps in atomic spectroscopies and matrices and other methods	[04]
	(c)	What is the plasma? Why scientist use a plasma for MS?	[04]

Q.6	**(a)**	Give the theory, instrumentation and applications of LCMS.	[08]
	(b)	Applications of LC-MS, LC-NMR & LC-NMR-MS with example.	[06]

OR

Q.6	**(a)**	Give the function of the magnet, sample holder, sweep coil, transmitter, receiver and detector for NMR used in hyphenated LCNMR technique	[08]
	(b)	Write brief note on introduction and basic principles of LCNMR.	[06]

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