Enrollment No:	Exam Seat No:
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## **C.U.SHAH UNIVERSITY**

## **Summer Examination-2016**

**Subject Name: Analytical Chemistry-II** 

Subject Code: 4SC06CHC4 Branch: B.Sc. (Chemistry)

Semester: 6 Date: 13/05/2016 Time: 02:30 To 5:30 Marks: 70

## **Instructions:**

- (1) Use of Programmable calculator & any other electronic instrument is prohibited.
- (2) Instructions written on main answer book are strictly to be obeyed.
- (3) Draw neat diagrams and figures (if necessary) at right places.
- (4) Assume suitable data if needed.

Q-1		Attempt the following questions:	(14)
•	a)	Give the priniciple of NMR spectroscopy.	1
	<b>b</b> )	What is pH?	1
	c)	In GLC, stationary phase is used as	1
	,	a) Silica Gel b) Silicon Oil c) Hydrogen d) CCl <sub>4</sub>	
	d)	Define metastable peak in mass spectroscopy.	1
	<b>e</b> )	What is a chemical shift?	1
	<b>f</b> )	What is the principle of potentiometry?	1
	g)	Which of the following electrode is used as indicator electrode in redox potentiometry titration?  a) Calomal b) Silver-silver electrode c) Platinum electrode d) Glass electrode	1
	h)	What is spin spin coupling constant?	1
	i)	Which ion is precipitated first in potentiometry titration of mixture of Cl <sup>-</sup> , Br <sup>-</sup> and I against AgNO <sub>3</sub> .	1
	j)	For successful ionization in mass spectroscopy sample must be in a) Gaseous state b) Liquid state c) Solid state d) All state	1
	k)	What are equivalent protons?	1
	1)	Give the number of signals in the following compound?	1
	m)	Which gas is generally used as carrier gas in GLC?	1
	n)	In mass spectrometer, analyzer tube is	1
		a) Amplifier b) Recorder c) Ion separator d) Detector	
Attem	pt any f	Four questions from Q-2 to Q-8	
Q-2	-	Attempt all questions	(14)
-	a)	Explain deuterium labeling in NMR spectroscopy.	5
	<b>b</b> )	Discuss the importance of Mass spectra.	5
	c)	Write the isomers of C <sub>3</sub> H <sub>8</sub> O and indicate number of PMR signals.	4



Q-3		Attempt all questions	(14)
_	a)	What are pH metry titration? Explain the methods used to measure pH.	7
	<b>b</b> )	Give the principle of Gas chromatography. Explain the instrumentation in GLC.	7
Q-4		Attempt all questions	(14)
	<b>a</b> )	Explain Mass instrumentation.	7
	<b>b</b> )	Explain the principle of Mass spectroscopy. Discuss the ions produced in the	7
		ionization chamber.	
Q-5		Attempt all questions	(14)
-	a)	Explain the factors influencing chemical shift.	6
	<b>b</b> )	Why TMS is used as reference standard in NMR spectroscopy?	4
	<b>c</b> )	Acetylene protons show NMR signal in upfield. Explain.	4
Q-6		Attempt all questions	(14)
	a)	Give the selection of carrier gas and stationary phase in GLC.	7
	<b>b</b> )	Enlist types of potentiometric titration. Explain any two.	7
Q-7		Attempt all questions	(14)
	<b>a</b> )	Find out pH of mixture of 10 mL 0.1 M HCl and 40 mL 0.2 M H <sub>2</sub> SO <sub>4</sub> .	5
	<b>b</b> )	Explain the factors affecting on GLC technique. Also give the uses of GLC.	5
	c)	Derive the formula for determination of dissociation constant of weak acid by pH	4
		metry.	
Q-8		Attempt all questions	(14)
	a)	Assign the structure to a compound from the following spectral results.	5
		Molecular formula: $C_8H_{10}O_2$	
		IR: 3300-3200 cm <sup>-1</sup> (broad), 2950, 2845, 1605, 1510, 1460, 1310, 1250, 1175,	
		1032, 820 cm <sup>-1</sup>	
		NMR:	
		(a) Singlet $\delta 3.5$ 1H	
		(b) Singlet $\delta 4.5$ 3H	
		(c) Singlet $\delta 2.6$ 2H	
		(d) Complex δ 7.17 4H	
	<b>b</b> )	<i>v</i>	5
		solution and also find pH. $(Ka = 1.8 \times 10^{-5})$	
	c)	Indicate the number of signals and multiplicity of the following compounds.	4

