Enrollment No: _____ Exam Seat No:_____

C.U.SHAH UNIVERSITY

Winter Examination-2015

Subject Name : Chemistry - I
Subject Code :4SC01CHC1 **Branch :B.Sc. (All)**

Semester :1 **Date :09/12/2015** **Time :10:30 To 1:30** **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)	Define Ionization Potential	**(1)**
	b)	Define Electron Affinity	**(1)**
	c)	Define Hybridization	**(1)**
	d)	Calculate spin magnetic moment of $K_3[TiF_6]$. (Ti: Z=22)	**(1)**
	e)	Write the electrophilic substitution reaction of Benzene	**(1)**
	f)	Give the nomenclature of 	**(1)**
	g)	Define Isothermal process	**(1)**
	h)	Define Heat capacity	**(1)**
	i)	Define Adsorption	**(1)**
	j)	Define Molality	**(1)**
	k)	Write the formula for weight fraction	**(1)**
	l)	What are amphiprotic solvents?	**(1)**
	m)	What are buffer solutions?	**(1)**
	n)	What is the shape of PCl_5?	**(1)**

Attempt any four questions from Q-2 to Q-8

Q-2		**Attempt all questions**	**(14)**
	a)	Discuss any five factors affecting magnitude of Electronegativity.	**(5)**
	b)	Interneuclear distance in KCl is 3.14 A and screening constant is 11.25. Calculate ionic radius of K^+ and Cl^-. [Z(K)= 19, Z(Cl)=17].	**(5)**
	c)	Explain Crystal Radius and Ionic radius.	**(4)**
Q-3		**Attempt all questions**	**(14)**
	a)	Discuss hybridization of CH_4	**(5)**
	b)	Describe Valance Shell Electron Pair Repulsion Theory.	**(5)**
	c)	Explain Physical Properties of first transition series elements.	**(4)**
Q-4		**Attempt all questions**	**(14)**
	a)	Write a note on non-stoichiometric and Interstial compound.	**(4)**
	b)	Explain SN_1 and SN_2 reactions with mechanism.	**(7)**

	c)	Write the reactions of alkyl halides with KSH, KNO_2 and K_2S	**(3)**
Q-5		**Attempt all questions**	**(14)**
	a)	Explain Perkin method for the preparation of cycloalkane.	**(5)**
	b)	Discuss Various methods to prepare large ring cycloalkanes.	**(5)**
	c)	Describe Bayer's Strain Theory.	**(4)**
Q-6		**Attempt all questions**	**(14)**
	a)	Derive Cp-Cv=R	**(5)**
	b)	Explain Work obtained during Isothermal change.	**(5)**
	c)	Write various statement of First law of Thermodynamics.	**(4)**
Q-7		**Attempt all questions**	**(14)**
	a)	Give differences between Physiorption & Chemisorption.	**(5)**
	b)	Write various applications of adsorption.	**(5)**
	c)	For 10% (W/W) solution of NaCl what is the mole fraction of each component in the solution? (Molecualr weight: NaCl= 58.5 and H_2O= 18)	**(4)**
Q-8		**Attempt all questions**	**(14)**
	a)	A buffer solution contains 0.2 mole of acetic acid & 0.25 mole of CH_3COOK per liter. Calculate the change in pH of the solution if 0.5 ml of 1M HCl is added to it. Ka for CH_3COOH is $1.7x10^{-5}$ at room temperature.(the volume change on the addition of HCl may be neglected).	**(5)**
	b)	Derive the equation for the pH, K_h and degree of hydrolysis for salt of weak acid and weak base.	**(5)**
	c)	Explain proton transfer theory with examples.	**(4)**