Enrollment No: _____ Exam Seat No: _____

C.U.SHAH UNIVERSITY

Winter Examination-2018

Subject Name: Chemistry-I

Subject Code: 4SC01CHC1/4SC01CHE1 Branch: B.Sc. (All)

Semester: 1 Date: 05/12/2018 Time: 02:30 To 05:30 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: SN_2 reaction **(1)**

b) Write bond angle for *sp* hybridization. **(1)**

c) Give the IUPAC name of following structure. **(1)**

d) Give the example of partially miscible liquids. **(1)**

e) Give only mathematical form of first law of thermodynamic. **(1)**

f) What is Lewis acid? **(1)**

g) Give the name of two type of standard solution. **(1)**

h) Define: E_1 reaction **(1)**

i) Which carbon atom have big covalent radius between this two pair: C=C, C≡C? **(1)**

j) Which of following has sp^3 hybridized carbon? **(1)**

(a) C_2H_2 (b) C_2H_4 (c) C_2H_6 (d) CH_4

k) What is adsorption? **(1)**

l) What is ionic radius? **(1)**

m) Define: Heat capacity **(1)**

n) In gas mask toxic gases are adsorbed by charcoal hence charcoal act as… **(1)**

(a) Sorption (b) Adsorbate (c) Catalyst (d) Adsorbent

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

Q-2 **Attempt all questions** **(14)**

(a) Explain SN_1 reaction with mechanism and its energy diagram. **(7)**

(b) Write a note on Langmuir adsorption isotherm with diagram (At high pressure only). **(7)**

Q-3 **Attempt all questions** **(14)**

(a) Give the definition of pH of solution and Calculate the pH of a 0.20 m solution of **(5)**

NH_4Cl. [K_b=1.8 x 10^{-5}]

(b) Derive the equation to calculate ionic radius and also write two assumption of Pauling which he use for this derivation. **(5)**

(c) Write a short note on preparation of standard solution. **(4)**

Q-4 **Attempt all questions** **(14)**

(a) Explain intensive and extensive properties with examples. **(6)**

(b) Derive C_p- C_v = R. **(5)**

(c) Write types of system with example. **(3)**

Q-5 **Attempt all questions** **(14)**

(a) Write brief note on ionization potential and factors affecting on it. **(7)**

(b) Give the definition of normality and calculate that for preparing this two type of $KMnO_4$ solution of 0.05 N and 0.05 M in 250 ml how many grams of pure $KMnO_4$ is required for each solution. [mol. wt. of $KMnO_4$=158 and eq. wt. of $KMnO_4$=31.6]. **(5)**

(c) What is sp^2 hybridization explain in short with only one example. [No need to figure]. **(2)**

Q-6 **Attempt all questions** **(14)**

(a) Discuss types of adsorptions with examples. **(5)**

(b) Give the chemical properties of cycloalkanes. **(5)**

(c) Write a Perkin method for preparation of cycloalkanes. **(4)**

Q-7 **Attempt all questions** **(14)**

(a) Give the definition of mole fraction and what is mole fraction of each component for 5% (w/w) solution of KCl? [molecular weight : KCl=74.5, H_2O=18] **(5)**

(b) What is hybridization? Discuss sp^3d and sp^3d^2 hybridization in short [No need to figure]. **(5)**

(c) Write any four rules for VSEPR theory with short description of it. **(4)**

Q-8 **Attempt all questions** **(14)**

(a) Give the substitution reaction of alkyl halide with aqueous KOH, dry Ag_2O, Na_2S & K_2S and Alcoholic KCN **(7)**

(b) What is buffer solution explain briefly with mechanism. **(7)**