Exam Seat No:_____ **Enrollment No:**_____

C.U.SHAH UNIVERSITY

WADHWAN CITY

University (Winter) Examination -2013

Course Name : B.Sc Sem-I **Subject Name: - Chemistry-I**

Duration :- 3:00 Hours **Date : 11/12/2013**

Instructions:-

(1) Attempt all Questions of both sections in same answer book / Supplementary.
(2) Use of Programmable calculator & any other electronic instrument is prohibited.
(3) Instructions written on main answer Book are strictly to be obeyed.
(4) Draw neat diagrams & figures (If necessary) at right places.
(5) Assume suitable & Perfect data if needed.

SECTION-I

Q-1 Answer the following short questions. (7)

Each question carries ONE mark. (Compulsory)

1. The chemical, $BeCl_2$ shows _____ type of hybridization.
2. Write the Modern Periodic Law.
3. 's' orbital is _____ and 'p' orbitals are _____ in shape.
4. Write full form of VSEPR.
5. Draw structure of cyclopentane.
6. Give IUPAC name of CH_3-CH (CH_3)-CH_2-CH_2-OH
7. Metals are _____ of electricity and heat.

Q-2 A) Write a short note on VSEPR theory. (5)

B) Write differences between Ionic bond and Covalent bond. (5)

C) Explain sp3 hybridization in methane. (4)

OR

Q-2 A) Explain method of preparation of Cycloalkane by Perkin's method. (5)

B) Write a detailed account on Pauli's method for the determination of ionic radius of isoelectronic ions. (5)

C) What are Elimination reactions of Alkyl halides? Discuss E2 and E1 reaction mechanism. (4)

Q-3 A) Differentiate Sigma bond and pi-bond. (5)

B) Explain the Ionization potential in detail. (5)

C) What is Hybridization? Explain different types of Hybridization. (4)

OR

Q-3 A) What are Electron affinity and Electonegativity? Explain the change of Electonegativity in the periodic table? (5)

B) Explain in detail any TWO methods for preparation of Cycloalkanes. (5)

C) What are Substitution reactions of Alkyl halides? Discuss SN2 and SN1 reaction mechanisms. (4)

SECTION-II

Q-4 Answer the following short questions. (7)

Each question carries ONE mark. (Compulsory)

1. Define: Molarity.
2. A system that can transfer neither matter nor energy to and from its surroundings is called _____.
3. Define: First transition series

4. Which term is used when Adsorption and Absorption take place simultaneously?
5. Calculate the pH of 0.001 M HCl.
6. Define: Molality
7. In 1930, _____ proposed that an Acid is an electron-pair acceptor and a Base is an electron-pair donor.

Q-5 A) Calculate Molarity (M) and Normality (N) of H_2SO_4 solution when 294 gm of H_2SO_4 is dissolved in 800 ml of water (Molecular weight and equivalent weight of H_2SO_4 are 98 gm and 49 gm respectively). (3)

B) Calculate molality (m) of solution if 16.0 gm of NaOH is dissolved in 2 Kg of water. Molecular weight of NaOH is 40 gm. (2)

C) To prepare 10 % V/V aqueous solution of alcohol, how many ml of water is required if 15 ml alcohol is dissolved? (2)

D) Discuss the physical and chemical properties of 3d-transition elements. (3)

E) Define the following terms: (4)

(i) Arrhenius acids-bases
(ii) Lewis acids-bases
(iii) Bronsted acids-bases
(iv) pH of solution

OR

Q-5 A) Derive an equation to show thermodynamically that for an ideal gas $Cp - Cv = R$ (5)

B) Write the differences between Physical adsorption and Chemical adsorption. (5)

C) Write the applications of Adsorption. (4)

Q-6 A) Calculate Molarity (M) and Normality (N) of 2 L solution containing 106 gm Na_2CO_3 (2Na: 46, C:12, 3O: 48) (3)

B) If 100 ml volume of 0.5 M HCl is diluted upto 2 L, What will be the Normality (N) of the resultant solution? What will be the Molarity (M) of the same solution? (3)

C) How many ml of ether is required to be solubilized in H_2O to prepare 8 % V/V in 500 ml aqueous solution? (2)

D) Calculate the pH of 0.1 M NH_3 solution. The ionization constant, k_b for NH_3 is 1.8×10^{-5}. (2)

E) Derive the expression for the hydrolysis constant (k_h) of the salt of weak acid and a strong base in terms of k_a and k_w. (4)

OR

Q-6 A) Differentiate Reversible and Irreversible processes. (5)

B) Write the Assumptions of Langmuir adsorption isotherm and derive the equation pertaining to it. (5)

C) Write a short note on Zeroth law of thermodynamics. (4)

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