Sardar Kaurey Khan Public Higher Secondary School Muzaffargarh

Name……. …….. **Date: -** 04 – 05 – 2020

Chemistry: - 1st year TEST # 3 **Time: -** 20 min… **Marks** 17

I. Which one has the largest radius? (a) Na (b) Na^{+} (c) Mg^{+2} (d) Al^{+3}

II. Which one compound is not formed according to "Octet rule" (a) Ammonia (b) Baron tri fluoride (c) Water (d) Methane

III. Which one is an inert gas having strong triple bond? (a) N_2 (b) Ne_2 (c) O_2 (d) Cl_2

IV. The pair having similar geometry is: (a) NH_3, PH_3 (b) H_2O, C_2H_2 (c) CO_2, SO_2 (d) BF_3, NH_3

V. In a molecule there are two lone pairs and two bond pairs around the central atom and two monovalent atoms combine to that. The shape of the molecule is: (a) Tetrahedral (b) Triangular planar (c) V-shaped (d) Pyramidal

VI. The maximum number of electrons entering in a molecular orbital is: (a) Four (b) Three (c) Two (d) One

VII. Which of the following has minimum dipole moment? (a) CO_2 (b) $CHCl_3$ (c) H_2O (d) CO

VIII. The one meter coulomb (1mC) is equal to how many Debye?
(a) 3.336×10^{-30} (b) 2.99×10^{-29} (c) 3.336×10^{30} (d) 2.99×10^{29}

IX. Molecule in which the distance between two carbon atoms is shortest is: (a) Ethane (b) Ethene (c) Ethyne (d) Benzene

X. Addition of substance among the reactants or the removal of a substance among the products at equilibrium stage disturbs the equilibrium position and reaction is shifted to
(a) Reverse direction (b) Forward direction (c) Bothe directions (d) None of these

XI. Maximum %age dissociation of CH_3OOH is when it aqueous solution is? (a) 0.100M (b) 0.050M (c) 0.005M (d) 0.001

XII. For which one of the following systems the Kp is smaller than Kc under given conditions?
(a) $N_{2(g)} + O_{2(g)} \rightleftharpoons 2NO_{(g)}$ (b) $2SO_{3(g)} \rightleftharpoons 2SO_{2(g)} + O_{2(g)}$ (c) $N_{2(g)} + 3H_{2(g)} \rightleftharpoons 2NH_{3(g)}$ (d) $PCl_{5(g)} \rightleftharpoons PCl_{3(g)} + Cl_{2\,(g)}$

XIII. Which one factor does not affect the equilibrium position of the reaction but reduces the time to attain the state of equilibrium.
(a) Temperature (b) Pressure (c) Presence of Catalyst (d) Concentration

XIV. The addition of 0.01 mole HCl per dm^{-3} of solution will change the pH of pure water from
(a) 7.00 to 11.00 (b) 7.00 to 2.00 (c) 7.00 to 3.00 (d) 7.00 to 12.00

XV. The low concentration of what type of ions helps to do the precipitation of basic radicals of second group?
(a) NH_4^{+} (b) S^{-2} (c) OH^{-1} (d) Cl^{-1}

XVI. The reaction between H_2 and O_2 proceeds to completion in the presence of electric spark when both gases (H_2 of O_2) are present in?
(a) Stoichiometric amounts (b) equal amounts (c) Nonstoichiometric amounts (d) unequal amounts

XVII. Conjugate base of a very weak acid is relatively very (a) weak acid (b) strong acid (c) strong base (d) weak base

Chemistry: - 1st year TEST # 3 **Time: -** 2hrs: 40min…. **Date: -** 04 – 05 – 2020

(**Subjective**) NOTE: Give short answers of all questions Section- **I** 22 x 2 = 44

Q. No 2. Give short answers of all questions **8x2=16**

i. Why is it not possible to determine the atomic sizes so precisely? **ii.** How ionization is an index to metallic character?
iii. Why He_2 molecule is not possible? **iv.** NH_3 and H_2O molecules can form a coordinate covalent bond with a proton but CH_4 not does so justify it why?
v. What is meant by hybridization? Give its types **vi.** Give difference between a sigma and a pi bond.
vii. Define the terms Bond Length, & Bond Energy **viii.** Why the cat ions smaller whereas anions are larger than their parent atoms?

Q. No 3 Give short answers of all questions **8x2=16**

i. Define pH and pOH. **ii.** What is the effect of common ion on the solubility of a salt?
iii. How do the buffers act? **iv.** How will you derive the Henderson's equation for a basic buffer?
v. How buffer solutions are mostly prepared?
vi. Ammonia has K_b value 1.85×10^{-5} at 25°C, what will be the pK_a value of its conjugate acid?
vii. Justify that the pKw becomes 75 times greater when temperature increases from 0°C to 100°C.
viii. Mention what are those two possibilities about the state of a reversible reaction at equilibrium?

Q. No 4 Give short answers of all questions **6x2=12**

i. What are the isoelectronic ions? **ii.** Why lone pair of electrons occupies more space than that of bond pair?
iii. What do you mean by electron affinity? Give its units **vi.** Give the difference between equilibrium constant and equilibrium position
v. How can we calculate the Ionic product of water at 25°C? **vi.** Derive that $K_a \times K_b = K_w$

Section- **II**

Note: Attempt all extensive questions 3x8=24

Q. No 5. (a) Write down the main postulates of VSEPR Theory 4+4

(b) $N_{2(g)}$ and $H_{2(g)}$ combine to give $NH_{3(g)}$. The value of K_c in this reaction at 500°C is 6.0×10^{-2}. Calculate the value of K_p for this reaction

Q. No 6. (a) What is dipole moment? Discuss its applications 4+4

(b) The solubility of PbF_2 at 25°C is 0.64g/dm^3. Calculate K_{sp} of PbF_2.

Q. No 7. (a) Compare the molecular orbital diagrams of N_2 and O_2 molecules 4 + 4

(b) A buffer solution has been prepared by mixing 0.2M CH_3COONa and 0.5M CH_3COOH in 1dm^3 of solution.
Calculate the pH of the solution. Ka of the acid is 1.8×10^{-5} at 25°C.
How the value of pH will change by adding 0.1M NaOH and 0.1M HCl solution separately.