HSSC-I Examination
Chemistry Guess Question Paper

Chapter 08
(ACIDS, BASES & SALTS)

SECTION – A

Time allowed: 20 minutes **Marks: 17**

Note: Section-A is compulsory. All parts of this section are to be answered on the question paper itself. It should be completed in the first 20 minutes and handed over to the Centre Superintendent. Deleting/overwriting is not allowed. Do not use lead pencil.

Q.1 Encircle the correct option i.e. A / B / C / D. All parts carry equal marks.

(i) Which of the following is conjugate base?
(a) NH_3 (b) H_3O^+ (c) Cl^- (d) NH_3

(ii)The pK_b value for aqueous ammonia at 25° C is 4.8. What is the pK_a value for the ammonium ion at this temperature:
(a) -4.8 (b) 2.2 (c) 4.8 (d) 9.2

(iii) pH of 1.0 mole dm^{-3} of H_2X which is only 50% dissociate is:
(a) 0 (b) 1 (c) 2 (d) 3

(iv) The aqueous solution of copper sulphate is acidic due to the hydrolysis of
(a) SO_4^{2} (b) Cu^{2+} (c) Both A & B (d) None of these

(v) The pH of 10^{-3} mole dm^{-3} of an aqueous solution of H_2SO_4 :
(a) 3.0 (b) 2.7 (c) 2.0 (d) 1.5

(vi) If K_a value is 10^{-6} the K_b value is:
(a) 10^{-4} (b) 10^{-6} (c) 10^{-8} (d) 10^{-10}

(vii) If Ca $OH)_2$ is dissolved in solution of NaOH, its solubility, as compared to that in pure H_2O
(a) Increases (b) Decreases
(c) First decreases than increases (d) Remains unaffected

(viii) The pOH of 10^{-8} molar solution of HCl in water is:
(a) 8 (b) Between 7 & 8 (c) -8 (d) 6

(ix) If an acid having K_a value less than 10^{-3} it will be:
(a) strong acid (b) weak acid (c) moderately acidic (d) Unpredictable

(x) Which one of the following solution is buffer solution?
(a) HCl + KCl (b) $HClO_4 + NaClO_4$
(c) $H_2CO_3 + NaHCO_3$ (d) $H_2SO_4 + NH_4Cl$

(xi) Which salt when added in water does not affect pH, then concentration of H_2S:
(a) increases (b) remains unchanged
(c) decreases (d) None of these

(xii) The H^+ ion concentration of an aqueous solution having pH 10.6 is:
(a) 2.51×10^{-11} mole dm^{-3} (b) 5.21×10^{-11} mole dm^{-3}
(c) 1.25×10^{-11} mole dm^{-3} (d) 3.21×10^{-11} mole dm^{-3}

(xiii) Which one of the following is not a Lewis base?
(a) NF_3 (b) BF_3 (c) NH_3 (d) H_2O

(xiv) The pK_b of compound X at 25ºC is 8.25. then the pK_a value of its conjugate acid will be:
(a) +6.75 (b) -6.75 (c) +5.75 (d) -5.75

(xv) pH of 0.062 M NaOH Solution is:
(a) 13.79 (b) 11.35 (c) 6.25 (d) 12.79

(xvi) What will be the pH of a Buffer if Conc. Of acid & salt are equal?
(a) Positive (b) Negative (c) Equal to pKa (d) Zero

(xvii) Which of the following compounds will produce acidic solution on Hydrolysis?
(a) KNO_3 (b) NaCl (c) NH_4NO_3 (d) NaCN

Time allowed: 2.40 hours **Total Marks: 68**

Note: Answer any eleven parts from Section 'B' and Attempt any two questions from Section 'C' on the separately provided answer book. Use supplementary answer sheet i.e. Sheet–B if required. Write your answers neatly and legibly.

SECTION – B (Marks 42)

Q.2 Attempt any **Fourteen** parts from the following. All parts carry equal marks.

(i) What is K_w? What is the effect of temperature on the value of K_w?

(ii) How PH and POH are related with each other?

(iii) Calculate the PH of 10^{-4} mal/dm^3 of HCl.

(iv) Prove that $PK_a + PK_b = 14$ at 25°C

(V) what is the concentration of hydroxide ion in a solution whose PH is 10?

(vi) What is hydrolysis? Write the equation of hydrolysis equilibrium for each of the followings:-

(a) Li^+ (b) NH_4^+ (c) CN^-

(vii) Explain curdling of milk with Lemon juice

(viii) what are K_b and PK_b and their applications?

(ix) Calculate the PH of Formic acid Sodium Formate buffer solution containing 1.0 mole

of each component. (K_a for formic acid is 1.8×10^{-4})

(x) Explain gastric acidity and use of anti-acid drug.

(xi) Calculate concentrations of ions of slightly soluble salts using concepts of solubility product.

(xii) Define and briefly describe the levelling effect of water in acid-base reaction.

(xiii) How many types of salts are there on the basis of reactivity with water? Give an example of each.

(xiv) Calculate the PH of a buffer solution in which 0.11 Molar CH_3COONa and 0.09 Molar CH_3COOH solution are present. (K_a for CH_3COOH is 1.8×10^{-5})

(xv) What is the relationship between K_a and K_b? and also Prove that $K_a \times K_b = K_w$

(XVI) The PK_a of acetic acid at 25°C at +4·76. Calculate the PK_b of the conjugate base of acetic acid.

(XVii) The PH of a 0·1M solution of an acid is 2·85. Calculate the ionization constant, K_a of the acid.

(XViii) Calculate the PoH of 0·001M HCl Solution.

(XiX) Prove that CH_3COOH acts as a Bronsted acid as well as a base.

(xx) Define the following:-
(a) Acid dissociation Constant (K_a)
(b) Base dissociation constant (K_b).

(xxi) what is the PH of a solution containing 1·95g pure H_2SO_4 per dm^3 of solution?

(XXii) Calculate the PH of 0·062M NaOH Solution.

(XXiii) Calculate the PH of 0·001M aqueous Hydrochloric acid Solution.

(XXiV) The Concentration of $[OH^-]$ ions in a household ammonia solution is 0·005M. Calculate the concentration of $[H^+]$ in it.

SECTION – C (Marks 26)

Attempt any **Two** Questions from the following.

(1) Q.(a) What are Buffer Solutions? Elaborate with suitable examples, their significance in acid-Base reaction. write three common applications of buffer solutions.

(b) Calculate the concentration of ions of slightly soluble salts using concept of Solubility Product.

(2) Q.(a) Define and explain Lewis acid and Bases also give one example in each case.

(b) Whate are conjugate acid-Base pairs? Given examples.

(3) Q.(a) How many types of salts are there? Give an example of each.

(b) Define PH. what are the values of PH for acidic, basic and neutral solutions.

(c) Justify that CaO is a basic oxide while Al_2O_3 is amphoteric oxi

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