HSSC-I Examination
Chemistry Guess Question Paper

Chapter 11 & 12
(THERMOCHEMISTRY & ELECTROCHEMISTRY)

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) Enthalpy is measured at:?
(a) 300 K & 2 atm (b) 300 K & 2 atm (c) 300 K & 1 atm (d) 295 K & 1 atm

(ii) For the reaction NaOH + HCl --------> NaCl + H_2O, the change in enthalpy is called:
(a) Heat of Neutralization (b) Heat of Combustion
(c) Heat of formation (d) Heat of reaction

(iii) Reaction of water with quick lime results in the rise of temperature. Indicate the nature of the reaction:
(a) Endothermic reaction (b) Third order reaction
(c) Non-spontaneous reaction (d) Exothermic reaction

(iv) $Mg_{(s)} + \frac{1}{2} O_{2\,(g)}$----------> $MgO_{(g)}$ $\Delta H = -692\ kj.mol^{-1}$ at STP. Enthalpy of the above reaction will be called:
(a) ΔH_{at} (b) ΔH_s (c) ΔH_{sol} (d) ΔH_f

(v) Born Haber's cycle enables us to calculate:
(a) Heat energy (b) Lattice Energy (c) Heat of Hydration (d) Heat of Solution

(vi) One joule is equivalent to _____ calori.
(a) 1/ 4.184 (b) 1/ 41.84 (c) 4.184 (d) 41.84

(vii) When a pressure of 500 Nm^{-2} is applied and volume change from 0.05 m^3 then work done by the system is:
(a) 10 J (b) -10 J
(c) -25 J (d) +25 J

(viii) The standard enthalpy of formation is zero for:

(a) H_2O (b) NaCl (c) ZnO (d) N_2

(ix) Which one pair has the same oxidation state of 'Fe':

(a) $FeSO_4$ & $FeCl_3$ (b) $FeCl_2$ & $FeCl_3$ (c) $FeSO_4$ & $FeCl_2$ (d) None of these

(x) In all oxidation reactions, atoms of an element in a chemical species lose electrons and increase their:

(a) Oxidation states (b) Reductions
(c) Electrode (d) Negative charges

(xi) Stronger the oxidizing agent greater is the:

(a) Redox potential (b) emf of the cell
(c) Oxidation potential (d) Reduction Potential

(xii) Lead acid batteries discharge with time because of:

(a) Deposition of $PbSO_4$ at anode (b) Deposition of $PbSO_4$ at cathode
(c) Both A & B (d) Acid Neutralizes with time

(xiii) Study the following redox reaction:

$$\mathbf{10\ Cl^- + 16\ H^+ + 2MnO_4^- \text{-----> } 5\ Cl_2 + 2\ Mn^{+2} + 8\ H_2O}$$

(a) Manganese is oxidized from **+7** to **+2** **(b)** Chlorine is reduced from **0** to **-1**
(c) Chlorine ions are reduced from **-1** to **0** **(d)** Manganese is reduced from **+7** to **+2**

(xiv) Coinage metals Cu, Ag and Au are the best reactive because they have:

(a) Negative reduction Potential (b) Negative oxidation potential
(c) Positive reduction Potential (d) Positive oxidation Potential

(xv) 2.5 Fd of electricity is passed through solution of $CuSO_4$. The number of gram equivalents of Cu deposited on the cathode would be:

(a) 1 (b) 2 (c) 2.5 (d) 1.25

(xvi) The number of moles of Cr deposited by passing 1.5 F electricity in the following reaction: $Cr^{+3} + 3e^- \text{--------> } Cr$ will be?

(a) 0.5 moles (b) 1.0 moles (c) 1.5 moles (d) 3 moles

(xvii) What is added with S in order to balance the following equation:

$$\mathbf{S \text{----------> } H_2S}$$

(a) $2H^+$, $1e^-$ (b) $2H^+$, $3\ e^-$ (c) $2H^+$, $4\ e^-$ (d) $2H^+$, $2e^-$

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.

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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