2011

Roll No. | | | | | | | Answer Sheet No._____

Sig. of Candidate._____ Sig. of Invigilator._____

CHEMISTRY HSSC–I

SECTION – A (Marks 17)

Time allowed: 25 Minutes

NOTE:- **Section–A is compulsory and comprises pages 1–2. All parts of this section are to be answered on the question paper itself. It should be completed in the first 25 minutes and handed over to the Centre Superintendent. Deleting/overwriting is not allowed. Do not use lead pencil.**

Q. 1 **Circle the correct option i.e. A / B / C / D. Each part carries one mark.**

(i) Which one of the following substance is not obtained by sublimation?

A. Napthlene B. NH_4Cl

C. Potash Alum D. Camphor

(ii) Equal mass of CH_4 and O_2 are mixed in empty vessel at 25^oC. The fraction of total pressure exerted by 02 is:

A. $1/3$ B. $8/9$

C. $1/9$ D. $16/17$

(iii) The rate of change of vapour pressure with temperature is given by:

A. Kinetic equation
B. Vander Waal's equating
C. Arhenius equation
D. Clausis Clapeyran equation

(iv) Half life of $_{92}U^{235}$ is:

A. 7.0×10^{8} year B. 6.1×10^{8} year

C. 8.1×10^{7} year D. 7.1×10^{10} year

(v) Which of the following reaction involve oxidation and reduction?

A. $NaBr + HCl \longrightarrow NaCl + HBr$

B. $HBr + AgNO_3 \longrightarrow AgBr + HNO_3$

C. $H_2 + Br_2 \longrightarrow 2HBr$

D. $2NaO + H_2SO_4 \longrightarrow Na_2SO_4 + H_2O$

(vi) Which of the following does not has dipole-moment?

A. ClO_2 B. CO_2

C. NO_2 D. SO_2

(vii) Atomic weight of C, N and O is 12, 14, 16 amu, respectively. Among the following pair of gases, the pair which can diffuse at same rate is:

A Carbon dioxide and Nitrous oxide
B. Carbon dioxide and Nitrogen peroxide
C. Carbon dioxide and Carbon monoxide
D. Nitrous oxide and Nitrogen peroxide

(viii) Which of the following has highest solubility in water?

A $Ca(OH)_2$ B. $Fe(OH)_3$

C. $Cr(OH)_3$ D. $Zn(OH)_2$

DO NOT WRITE ANYTHING HERE

(ix) $20g$ of $NaOH$ has been dissolved in $2\,dm^3$ of solution. The molarity of the solution is:

A. $0.05\,M$ B. $0.25\,M$

C. $0.5\,M$ D. $1.0\,M$

(x) The slope of Arhenius equation can be represented as:

A. $\frac{-Ea}{2.303\,R}$ B. $\frac{-Ea}{2.303\,RT} + \log A$

C. $\frac{-Ea}{2.303\,RT}$ D. $\frac{-Ea}{RT}$

(xi) An electron is moving with a velocity of $10^8\,cm/s$. What will be the wavelength associated with electron?

A. $72.7\,A^o$ B. $7.27\,A^o$

C. $727\,A^o$ D. $0.727\,A^o$

(xii) $He_2^4 + Be_4^9 \longrightarrow \times + n_0^1$ What is x?

A. N_7^{14} B. C_6^{12}

C. F_9^{18} D. Li_3^7

(xiii) A smuggler could not carry gold by chemically depositing iron on gold surface:

A. Gold is denser
B. Gold has higher reduction potential than iron
C. Iron rust
D. Gold has lower reduction potential than iron

(xiv) The rate of reaction can be increased by all factors except:

A. Increasing concentration of reactants
B. Increasing the activation energy
C. Using a catalyst
D. Increasing the temperature

(xv) Which relation is incorrect?

A. $v = c/\lambda$ B. $v = h/E$

C. $E = hc\,v^-$ D. $v^- = 1/\lambda$

(xvi) Which statement is true for the reaction given? $CuO + H_2 \longrightarrow Cu + H_2O$

A. CuO act as an oxidizing agent
B. CuO act as an acid
C. CuO act as a reducing agent
D. CuO act as a dehydrating agent

(xvii) Platinum, Palladium iridium etc. are called noble metals because:

A. Alfred Noble discovered them
B. They are inert towards many reagents
C. They are shining lustrous and pleasant to look at
D. They are found in native state

For Examiner's use only:

Total Marks:	17
Marks Obtained:	

2011

CHEMISTRY HSSC–I

Time allowed: 2:35 Hours **Total Marks Sections B and C: 68**

NOTE:- **Sections 'B' and 'C' comprise pages 1–2 and questions therein are to be answered on the separately provided answer book. Answer any fourteen parts from Section 'B' and attempt any two questions from Section 'C'. 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. The answer to each part should not exceed 5 to 6 lines. (14 x 3 = 42)**

(i) A compound contain 42.5% Chlorine and 57.5% Oxygen. If its molecular mass is 167 what is its molecular formula? At. wt. $Cl = 35.5$, $O = 16\ amu$. 03

(ii) Why it is necessary to mention physical states of reactants and products in a thermo chemical reaction? 03

(iii) $16g$ of methane, $44g$ of carbon dioxide and $64g$ of sulpher dioxide occupy separately the volume of $22.414\,dm^3$ although the sizes and masses of three gases are very different from each other why? 03

(iv) Reactions of ionic compounds are faster than covalent compounds why? 03

(v) Differentiate between:

a. Containous and line spectrum. 1.5

b. Line emission and line absorption spectrum. 1.5

(vi) A photon has wavelength of $509\,nm$. Find out the energy, frequency and wave number of photon. 03

(vii) Explain hybridization in $BeCl_2$ and BF_3. 1.5+1.5

(viii) Calculate the Enthalpy change (ΔH) for the reaction: 03

$$2Al_{(S)} + Fe_2O_{3(S)} \longrightarrow 2Fe_{(S)} + Al_2O_{3(S)} \qquad \Delta H = ?$$

Enthalpy change for the combustion of Al and Fe are given below:

$$2Al_{(S)} + 1.5O_2 \longrightarrow Al_2O_3 \qquad \Delta H = -1675\,KJ$$

$$2Fe_{(S)} + 1.5O_2 \longrightarrow Fe_2O_3 \qquad \Delta H = -824.2\,KJ$$

(ix) Size of cation is smaller and anion bigger from parent atom why? 1.5+1.5

(x) Zinc act as anode when connected to copper but as cathode when connected to Aluminium. Write chemical equations in support of your answer. 1.5+1.5

Red^n potential $Zn = -0.67V$

Red^n potential $Al = -1.66V$

2011

(xi) What is the pH of $10^{-4}\ moles\ dm^{-3}$ of $Ba(OH)_2$? 03

(xii) Differentiate between Hydration and Hydrolysis by giving suitable examples. 1+2

(xiii) What are Electrochemical series? Give at least three applications of electrochemical series. 1+2

(xiv) Catalyst is a substance which accelerates the rate of reaction. What is catalysis? Differentiate between homogeneous and heterogenous catalysis. 1+1+1

(xv) Balance the following equation by oxidation reduction reaction: 03

$$FeSO_4 + K_2Cr_2O_7 + H_2SO_4 \longrightarrow K_2SO_4 + Fe_2(SO_4)_3 + Cr_2(SO_4)_3 + H_2O$$

(xvi) Propanone (CH_3COCH_3) Propanol $(CH_3-CH_2-CH_2-OH)$ and Butane $(CH_3-CH_2-CH_2-CH_3)$ have very similar molecular masses. List them in the order of increasing boiling points and explain. 03

(xvii) The species $N\bar{H}_2$, NH_3, NH_4^+ have bond angle of 105^o, 107.5^o, 109.5^o respectively. Justify these values by drawing their structures. 1+1+1

(xviii) Dipole moment of CO_2 is zero and that of H_2O is $1.85\ D$ why? How the %age of ionic character of the polar bond be determined? 1+2

(xix) what is law of mass action? Derive an expression for the equilibrium constant Ke for a general reversible reaction. 1+2

$$a\,A + b\,B \rightleftharpoons c\,C + d\,D$$

SECTION – C (Marks 26)

Note:- Attempt any TWO questions. All questions carry equal marks. (2 x 13 = 26)

Q. 3

a. Derive Boyle's law and Graham's law of diffusion on the basis of kinetic molecular theory. 3+3

b. What is chromatography? Explain its different types? 04

c. Solubility of sodium chloride does not increase with the increase in temperature why? 03

Q. 4

a. Calculate the bond energy of HCl. The bond energy of $H-H$ is $436\ KJ\ mole^{-1}$ and $Cl-Cl$ is $240\ KJ\ mole^{-1}$. 04

b. What are the drawback's of Rutherford's atomic model? 03

c. Derive the radius of Bohr's nth orbit of electron in H atom. Is it true that higher orbits have more radii? 5+1

Q. 5

a. Derive Vander Waal's equation. 05

b. How molecular mass of a solute can be determined by Land's berger method? 04

c. Differentiate between orbit and orbital. 04

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