Roll No _____ to be filled in by the candidate

HSSC-(P-I)-A/2023

Marks : 68

Chemistry (Subjective) (GROUP-I) (For All Sessions) Time: 2:40 hours

SECTION-I

2. **Write short answers of any eight parts from the following:** (8x2=16)

i. Why Isotopes of same element show similar chemical properties?

ii. Prove N_2 and CO have the same number of electrons, protons and neutron.

iii. Define molecular ion with examples.

iv. What is $\Delta H°f$? Give one example.

v. Why gases behave non ideally at high pressure and low temperature?

vi. What are the two faulty points of KMT?

vii. What is plasma? How it is formed?

viii. What is Zeeman effect?

ix. Why positive rays are also called as canal rays?

x. The e/m value of positive rays for different gases is different? Justify it.

xii. Define Lattice Energy? Give example.

xii. What is state function? Give any two examples.

3. **Write short answers of any eight parts from the following:** (8x2=16)

i. Define ppm and give its mathematical formula?

ii. State Raoult's law.

iii. Elevation of boiling point is a colligative property. Justify it.

iv. Give two characteristics of enzyme catalyst.

v. Define half life period. Give one example.

vi. Define homogeneous catalysis with an example.

vii. Evaporation causes cooling. Explain with reason.

viii. Define Allotropy with an example.

ix. What do you mean by lattice energy? Give an example.

x. Write down two uses of chromatography.

xi. What is fluted filter paper?

xii. Write any two methods for drying of crystals.

4. **Write short answers of any six parts from the following:** (6x2=12)

i. Justify that π bond are more diffused than sigma bond.

ii. Write the Lewis structures for the following compound: i) N_2O_5 ii) H_3PO_4

iii. What is bond order? Calculate bond order for H_2 molecule.

iv. Why change of temperature disturbs both the equilibrium position and the equilibrium constant of a reaction.

v. What is common ion effect? Give one example.

vi. What is PH and POH?

vii. SHE acts as anode when connected with Cu electrode but as cathode with Zn electrode. Give reason.

viii. Calculate the oxidation numbers of the elements underlined. i) $Na_3\underline{P}O_4$) ii) $H\underline{N}O_3$

ix. Define electrode potential.

SECTION-II

Note **Attempt any three questions. Each question carries equal marks:** (8x3=24)

5. (a) Define stoichiometry. Give its assumption and mention laws obeyed during stoichiometric calculation. 4

(b) Calculate the number of atoms in $20cm^3$ of CH_4 at 0°C and pressure of 700 mm of Hg. 4

6. (a) Define boiling point. What is the effect of external pressure on boiling point? Give two examples. 4

(b) Explain the Born-Haber cycle to calculate the lattice energy of sodium chloride. 4

7. (a) How neutron was discovered? Explain with the help of an experiment also write four properties of neutron. 4

(b) The equilibrium constant for the reaction between acetic acid and ethyl alcohol is 4.0. A mixture of 3 moles of acetic acid and one mole C_2H_5OH is allowed to come to equilibrium. Calculate the amount of ethyl acetate at equilibrium state in no of moles and grams. Also calculate mass of reactants left behind. 4

8. (a) Define ionization energy, name the factors influencing the ionization energies of elements. What is a trend of ionization energy in the periodic table. 4

(b) What is meant by Lead Accumulator explain it in detail, Give chemical equations of discharging and recharging. 4

9. (a) Differentiate between ideal and Non ideal solutions. 1x4=4

(b) Discusss how surface area and nature of reactants affect rate of a chemical reaction. 2+2=4