Roll No _____

HSSC-(P-I)-A-2024
(For All Sessions)

Marks : 68

Chemistry (Subjective)

(GROUP-I)

Time: 2:40 hours

SECTION-I

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

i. Define gram ion. Give two examples.
ii. One mole of H_2SO_4 should completely react with two moles of $NaOH$. How does Avogadro's number help to explain it?
iii. Give any four methods for the separation of isotopes.
iv. What is sintered glass crucible? Give its significance.
v. What is crystallization? Give its basic principle.
vi. What is chromatogram? Give an example.
vii. Derive Avogadro's law from kinetic molecular theory of gases.
viii. Give two characteristics of plasma.
ix. What is the effect of pressure and temperature on the density of an ideal gas?
x. Why is HCl added before passing H_2S gas for the detection of second group basic radicals during salt analysis?
xi. What is the effect of rise in temperature on the solubility of KI in water?
xii. What are buffer solutions? Give their two applications.

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

i. Why HF is weaker acid than other hydrogen halids?
ii. Define dipole-diploe forces of attraction with example.
iii. Why lower alcohols are soluble in water?
iv. Define crystal lattice and unit cell.
v. Why it is necessary to decrease pressure in discharge tube to get cathode rays?
vi. What is origin of line spectrum?
vii. Define stark effect.
viii. Discuss Pauli exclusion principle.
ix. Why aqueous solution of NH_4Cl is acidic in nature?
x. Define solubility with two examples.
xi. Radioactive decay is always first order reaction. Justify.
xii. Rate of reaction decreases with passage of time. Explain.

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

i. Potassium can displace hydrogen from acids but copper cannot. Explain by giving reason.
ii. Calculate the oxidation number of underlined elements : $H\underline{P}O_3$, $\underline{Cr}O_3$
iii. Differentiate between system and surrounding by giving example.
iv. Define enthalpy of combustion by giving suitable example.
v. What do you mean by internal energy? Briefly explain.
vi. The bond angle of H_2O is not 109.5° like that of CH_4. Although 'O' and 'C' are both sp^3 hybridized. Explain with reason.
vii. π-bonds are more diffused than σ-bonds. Explain with reason.
viii. The heat of vapourization of electrovalent compounds are higher than covalent compounds. Explain with reason.
ix. Write down basic assumption of VSEPR-theory.

SECTION-II

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

5. (a) Define following terms: (i) Atom (ii) Isotope (iii) Empirical formula (iv) Molecular formula. (4)
(b) Give four (04) applications of liquid crystals. (4)

6. (a) Calculate the density of CH_4 gas at $0°C$ and 1 atm. What will happen to the density if temperature is increased to $27°C$ (2+2)
(b) Explain azimuthal quantum number in detail. (4)

7. (a) Define ionization energy. How does it vary in the periodic table? What factors are responsible for their variations? (4)
(b) The solubility product of Ag_2CrO_4 is 2.6×10^{-2} at 25°C. Calculate the solubility of the compound. (4)

8. (a) Explain how enthalpy of a reaction can be measured by Bomb Calorimeter? Draw diagram also. (3+1)
(b) How electrode potential of Zn can be measured? Draw diagram also. (3+1)

9. (a) Define elevation of boiling point and describe Landsberger's method for measurement of boiling point elevation. (4)
(b) Define catalysis. Explain its types with suitable examples. (1+3)