CHEMISTRY (Subjective) GROUP - I

Time: 02:40 Hours Marks: 68

SECTION – I

short answers of any EIGHT parts. 16

What are molecular ions? How are they formed?
Define empirical formula. How is it related to molecular formula?
Define limiting reactant. How does it control the yield of product formed?
Define chromatography. Give its two applications.
How are coloured impurities removed from crystals?
Define absolute zero temperature.
Give four applications of plasma.
State Dalton's law of partial pressure. Give its mathematical form.
Calculate the numerical value of ideal gas constant 'R' in SI units.
Why is aqueous solution of $CuSO_4$ acidic in nature?
State Raoult's law in two different ways.
One molal solution of urea in water is dilute as compared to one molar solution of urea. Justify it.

e short answers of any EIGHT parts. 16

Water is liquid at room temperature while H_2S is a gas. Comment.
Why the density of ice is less than water?
Why heat of vaporization of water is greater than CH_4 ?
How liquid crystals act as temperature sensor?
How will you prove that cathode rays travel in straight line?
Give reason for the production of positive rays.
Derive de-Broglie equation $\lambda = \frac{h}{mv}$.
Give two defects in Rutherford atomic model.
Prove that $pK_a + pK_b = 14$ at 25°C.
Calculate pH of 10^{-4} mol · dm^{-3} of HCℓ.
Rate of reaction is an ever changing parameter. Give reason.
How does surface area effect the rate of reaction?

te short answers of any SIX parts. 12

Why atomic radius is greater than cationic radius?
How ionization energy varies in periodic table?
O_2 molecule is paramagnetic. Explain.
Molecular orbital theory is superior to valence bond theory. Comment.
Prove that $\Delta E = q_v$
Define heat and work.
How is voltaic cell represented?
) Define standard electrode potential.
Write chemical reactions taking place in NICAD cell.

SECTION – II Attempt any THREE questions. Each question carries 08 marks.

Define yield. How do we calculate the percentage yield of chemical reaction? Also mention the factors which are responsible for low yield of products. 04
Define hydrogen bonding. Give its three applications. 04
Assuming NH_3 gas to be ideal. Calculate its mass in grams if 1.00 dm^3 of NH_3 is enclosed in a container at 30°C and 1000 mmHg. 04
How charge on electron be measured by famous Millikan's oil drop experiment? 04
Define ionization energy. What factors do affect it? 04
State first law of thermodynamics. Write its mathematical expression. Prove that $\Delta H = q_p$ 04
What is the percentage ionization of acetic acid in a solution in which 0.1 mol of it has been dissolved per dm^3 of the solution. ($K_a = 1.85 \times 10^{-5}$) 04
Discuss four physical methods to determine the rate of reaction. 04
Define solubility curve. Explain different types of solubility curves with the help of graphs. 04
)Explain voltaic cell with the help of diagram and also discuss its working. 04