

Subjective

Note :- Section I is compulsory. Attempt any three (3) questions from Section II.
(Section I)

2. Write short answers to any Eight Parts. (8 x 2 = 16)

- i. Mg atom is twice heavier than that of a carbon atom. How?
- ii. Why 23 g of 'Na' and 238 g of uranium have equal number of atoms?
- iii. Define limiting reactant with an example.
- iv. Why is there a need to crystallize a crude product?
- v. Give two uses of chromatography.
- vi. Describe two causes of deviation of gases from ideality.
- vii. Pilots feel un-comfortable in breathing at high altitude. Why?
- viii. Give unit of Vander walls constant 'a' and 'b'.
- ix. What is the ionization constant of acid?
- x. What is the effect of catalyst on equilibrium constant?
- xi. What is the effect of common ion on solubility?
- xii. Define acids and bases by Lowry- Bronsted concept.

3. Write short answers to any Eight parts. (8 x 2 = 16)

- i. One feels sense of cooling under the fan after bath, explain with reason. .
- ii. What are liquid crystals? Who discovered it?
- iii. Ionic crystals do not conduct electricity in the solid state, give reason.
- iv. Explain the term ' Anisotropy ' with an example.
- v. Write the Lewis structures for the given compounds:. (a) HCN (b) CS₂
- vi. Explain the formation of coordinate covalent bond between NH₃ and BF₃
- vii. π - bonds are More diffused than sigma bond, give reason.
- viii. NH₃ and BF₃ are tetra atomic but different geometries, why?
- ix. Explain the term "Atomization energy" with an example.
- x. What is internal energy? What is effect of increase in internal energy on the system?
- xi. Define mole fraction; also give its mathematical expression.
- xii. Explain the term hydrolysis with an example.

4. Write short answers to any Six parts. (2 x 6 = 12)
- Calculate potential energy of an electron at a distance "r" from a nucleus.
 - Define Moseley's Law and give its mathematical equation.
 - Define (n+l) rule and Pauli's Exclusion principle.
 - Distribute electrons in orbital of Cu with atomic number 29.
 - Write down electrode reactions occurring during electrolysis of aqueous sodium Nitrate.
 - Explain Alkaline battery giving its electrode reactions.
 - Give differences between electrolytic cell and voltaic cell.
 - Explain mechanism of enzyme catalysis with diagram, briefly.
 - How does nature of reactants affect rate of reaction, give an example.

(Section - II)

Note: Attempt any three (3) questions from Section II. Each question carries 08 marks. (3 x 8 = 24)

- (a) A well known ideal gas is enclosed in a container having volume 500cm^3 at S.T.P. Its mass comes out to be 0.72 g. What is the molar mass of this gas?
 (b) Define vapour pressure. How is vapour pressure measured by Manometric method?
- (a) Write down eight postulates of Kinetic Molecular theory of gases.
 (b) Explain Millikan's oil drop experiment to determine the charge of an electron.
- (a) Define electronegativity. How does it vary in periodic table? And also discuss its effect on bond strength.
 (b) Prove that. $\Delta H = q_p$
- (a) What is the common ion effect? Describe it with an example and give its two applications in salt analysis with two examples.
 (b) Describe (i) silver oxide battery (ii) Nickel Cadmium cell
- (a) Hydrochloric acid available in the laboratory is 36 % (w/w). The density of HCl solution is 1.19g cm^{-3} . Determine the Molarity of HCl solution.
 (b) How energy of activation can be determined from Arrhenius equation.