

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

(SECTION – I)**2. Write short answers to any EIGHT questions.****(2 x 8 = 16)**

- i - Differentiate between theoretical yield and experimental yield.
- ii - Define mole with two examples.
- iii - Law of conservation of mass has to be obeyed during stoichiometric calculations. Justify it.
- iv - Iodine dissolves readily in CCl_4 . Why?
- v - What is chromatography and R_f value?
- vi - Calculate S.I. unit of R.
- vii - Derive Boyle's law from kinetic molecular theory of gases.
- viii - Write down any two characteristics of plasma.
- ix - State Charles's law. Write down its mathematical form.
- x - Relative lowering of vapour pressure is independent of temperature. Justify this statement.
- xi - Define hydration energy of ions.
- xii - What are continuous solubility curves? Give one example.

3. Write short answers to any EIGHT questions.**(2 x 8 = 16)**

- i - What is role of hydrogen bonding in paints, dyes, and textile materials?
- ii - What do you mean by liquid crystal? Write down any two uses of it.
- iii - Define the property of solids allotropy and give two examples.
- iv - The crystals showing isomorphism mostly have the same atomic ratios; explain.
- v - How neutron was discovered by Chadwick? Also write down reaction.
- vi - Write down postulates of Bohr's atomic model.
- vii - How azimuthal quantum number (ℓ) gives information about types of subshells?
- viii - Explain the concept of atomic spectrum.
- ix - Write down optimum conditions of temperature and pressure in the manufacture of ammonia by Haber's process.
- x - Define pH and pOH of solutions.
- xi - What do you understand by rate determining step? Give a suitable example.
- xii - How does Arrhenius equation help us to calculate the energy of activation of a reaction?

4. Write short answers to any SIX questions.**(2 x 6 = 12)**

- i - Define ionization potential of element. How ionization potential vary across the period?
- ii - Anionic radius is greater than that of its parent atomic radius. Why?
- iii - Draw the structure of NH_3 with reference to VSEPR Theory.
- iv - How do electronegativity values change in a group?
- v - Define enthalpy of solution with an example.
- vi - State first law of thermodynamics. Give its mathematical expression.
- vii - Calculate the oxidation numbers of elements underlined:
(a) $\text{Na}_2\underline{\text{C}}\text{O}_3$ (b) $\text{K}_2\underline{\text{Mn}}\text{O}_4$
- viii - Give function of salt bridge.
- ix - Why SHE acts as cathode when connected with Zn electrode but SHE acts as anode when connected with Cu? Justify.

(Turn Over)

(SECTION – II)

5. (a) When limestone (CaCO_3) is roasted then quicklime (CaO) is formed according to the following equation. The actual yield of (CaO) is 2.5 kg, when 4.5 kg of limestone is heated. What is the percentage yield of this reaction? (4)



- (b) Discuss the role of Hydrogen Bonding in Biological Compounds. (4)
6. (a) Write fundamental postulates of kinetic molecular theory of gases. (4)
- (b) Discuss four postulates of Bohr's model of atom. (4)
7. (a) What is Sp^3 hybridization? Explain the structure of methane. (4)
- (b) Explain measurement of enthalpy by a glass calorimeter. (4)
8. (a) Calculate the pH of 1.0 mole dm^{-3} of NH_4OH , which is 1% dissociated. (4)
- (b) Explain half life method for determination of order of reaction. (4)
9. (a) Freezing points of solutions are depressed when non-volatile solutes are present in volatile solvents. Justify it. Plot a graph to elaborate your answer. (4)
- (b) Discuss measurement of electrode potential by standard hydrogen electrode (S.H.E) (4)

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