

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 - What is the significance of John Dalton's work about atom?
- ii - Define molar volume, give an example.
- iii - How many moles are present in 18 g of H₂O?
- iv - What is effect of pressure and heat on the behaviour of gases?
- v - Give the S.I units of R.
- vi - State Avogadro's law and give an example.
- vii - Define frequency, give its relationship with wavelength.
- viii - Differentiate between continuous and line spectrum.
- ix - How neutron was discovered?
- x - Distinguish between Exothermic and Endothermic reactions.
- xi - Show how change in internal energy is related to q_v?
- xii - What do you know about standard enthalpy of neutralization?

3. Write short answers to any EIGHT questions.

(2 x 8 = 16)

- i - Define molarity and molar solution.
- ii - What are discontinuous solubility curves?
- iii - Define Hydrates with one example.
- iv - What is meant by activation of a catalyst?
- v - Draw lock and key model of enzyme catalysis.
- vi - How light affects rate of reaction?
- vii - What is sintered glass crucible? What is its advantage?
- viii - How fluted filter paper can be prepared?
- ix - Write down any two uses of chromatography.
- x - Define dipole-dipole forces. Give one example.
- xi - Define hydrogen bonding. Give one example.
- xii - What is meant by Anisotropy? Give one example.

4. Write short answers to any SIX questions.

(2 x 6 = 12)

- i - Define bond order and what is bond order of O₂²⁺
- ii - Why MOT is superior to UBT?
- iii - Differentiate between polar and nonpolar covalent bonds with examples.
- iv - How ammonia is synthesized by Haber's process? Also give the optimum conditions for reaction.
- v - Give the two applications of the solubility product.
- vi - The change of temperature disturbs both the equilibrium position and the equilibrium constant of a reaction. Explain with reason.
- vii - What is fuelcell and where it is used?
- viii - Write down two applications of electrochemical series.
- ix - What is SHE? Give its potential value.

(Turn Over)

SECTION – II

Note: Attempt any THREE (3) questions.

5. (a) Explain combustion analysis with diagram and write formulas for percentage of Carbon, Hydrogen and Oxygen. (2+1+1 =4)
- (b) Calculate the mass of 1 dm^3 of NH_3 gas at 30°C and 1000 mm Hg pressure, considering that NH_3 is behaving ideally. (4)
6. (a) What are London forces? Explain factors affecting London forces. (4)
- (b) State first law of thermodynamics. Also prove that $\Delta E = q_v$ (4)
7. (a) Describe Millikan's Oil Drop Method for the measurement of charge on an electron. (4)
- (b) The solubility product of $\text{Ca}(\text{OH})_2$ is 6.5×10^{-6} . Calculate the solubility of $\text{Ca}(\text{OH})_2$. (4)
8. (a) Define atomic orbital hybridization. Explain SP^2 hybridization by giving example of BF_3 . (4)
- (b) Define electrochemical series and give any three applications of it. (4)
9. (a) Discuss in detail any two examples of solutions of partially miscible liquid. (4)
- (b) Differentiate between homogeneous catalysis and heterogeneous catalysis with one example in each. (4)

218-1stA 323-35000