

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 experimental yield and theoretical yield.
- ii - Differentiate between atom and molecule.
- iii - Mg atom is twice heavier than Carbon atom. Justify it.
- iv - Write four features of a solvent used in crystallization.
- v - What is crystallization? Give its basic principle.
- vi - How coloured impurities are removed from a crystal?
- vii - Why liquids are less common in universe than gases and solids?
- viii - How Dalton's law is helpful in respiration?
- ix - Derive Charle's law from Kinetic equation of gas.
- x - Write relationship between K_c and K_p .
- xi - What is ionic product constant of water? How do temperature affect it?
- xii - State law of Mass action.

3. Write short answers to any EIGHT questions.

(2 x 8 = 16)

- i - Iodine dissolves readily in tetrachloromethane. Give reason.
- ii - Define polarizability. Give its significance.
- iii - Define unit cell. Name crystallographic elements.
- iv - Boiling needs constant supply of heat. Explain with reason.
- v - State any two properties of positive rays.
- vi - What is line spectrum? Give any one example.
- vii - State Moseley's Law.
- viii - State Hund's Rule. Give an example.
- ix - Define Catalysis. Give two examples.
- x - What is specific rate constant? Explain
- xi - Aqueous solution of CH_3COONa is basic in nature. Give reason.
- xii - Define molality. Give its units.

4. Write short answers to any SIX questions.

(2 x 6 = 12)

- i - Why does lone-pair occupy more space than bonding pair?
- ii - Radius of Cation is smaller than parent atom. Justify.
- iii - How bond length is affected by change in hybridization state?
- iv - Define electronegativity.
- v - Define the term standard enthalpy of neutralization.
- vi - What is state function? Give one example.
- vii - Discuss endothermic reaction with example.
- viii - Lead accumulator is chargeable battery. Justify.
- ix - Calculate oxidation number of Phosphorous in Na_3PO_4 .

(Turn Over)

SECTION – II

5. (a) What are limiting reactants? How are they identified? Give an example. (2+1+1=4)
(b) What are ionic solids? Give their three properties. (4)
6. (a) 250 cm^3 of Hydrogen gas is cooled from 127°C to -27°C by maintaining the pressure constant. Calculate the new volume of gas at low temperature. (4)
(b) Write down measurement of $\frac{e}{m}$ by J.J. Thomson with diagram. (4)
7. (a) Explain formation of Oxygen molecule according to Molecular Orbital Theory. Also draw diagram and calculate bond order. (4)
(b) What is the percentage ionization of acetic acid in solution in which 0.1 mol of it has been dissolved per dm^3 of the solution? (4)
8. (a) State 1st Law of Thermodynamics and prove $\Delta E = q_v$ (4)
(b) Define electrochemical series. Discuss calculation of the voltage of cell by giving one example. (4)
9. (a) Define the following terms: (4)
(i) Hydration (ii) Hydrates
(iii) Mole fraction (iv) parts per million (ppm)
(b) Discuss four factors that affect the rate of reactions. (4)

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