

SECTION – I

2. Write short answers to any EIGHT (8) questions :

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- (i) Why isotopes have same chemical properties but different physical properties?
- (ii) Define gram atom and gram molecule.
- (iii) Define stoichiometry, give its assumptions.
- (iv) Derive mathematical relationship for density of an ideal gas.
- (v) Why pilots feel uncomfortable in breathing at higher altitude?
- (vi) What are causes of deviation from ideality?
- (vii) What happens when a free neutron decay?
- (viii) Define Hund's rule and Aufbau principle.
- (ix) Define Mosley law. Give its importance.
- (x) Define enthalpy of solution. Give one example.
- (xi) Define internal energy and enthalpy.
- (xii) Why enthalpy of combustion of some compounds can not be measured directly?

3. Write short answers to any EIGHT (8) questions :

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- (i) How crystals are dried by reliable method?
- (ii) Define sublimation. Give the importance of sublimation.
- (iii) Differentiate between adsorption and partition chromatography.
- (iv) The boiling point of water is different at Murree hills and at Mount Everest. Give reason.
- (v) Describe crystallographic elements.
- (vi) The electrical conductivity of the metals decreases by increasing temperature.
- (vii) $Na_2SO_4 \cdot 10H_2O$ shows discontinuous solubility curve. Give reason.
- (viii) Define molarity. Give one example.
- (ix) Freezing points are depressed due to the presence of solutes.
- (x) Define energy of activation. What is the affect of temperature on the activation energy of a reaction?
- (xi) What is half life period? How it is used for the determination of order of a reaction?
- (xii) The rate of a chemical reaction is an ever changing parameter under the given conditions.

4. Write short answers to any SIX (6) questions :

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- (i) On what factors bond energy depends?
- (ii) Draw molecular orbital diagram of oxygen molecule.

(Turn Over)

4. (iii) Why ionic bonds are non-directional?
- (iv) Define buffer capacity.
- (v) State law of mass action.
- (vi) What is meant by percentage ionization of acids?
- (vii) A salt bridge maintains electrical neutrality in the cell. How?
- (viii) What is meant by electrolytic conduction?
- (ix) Calculate oxidation number of "P" in Na_2PO_4 .

SECTION – II

Note : Attempt any **THREE** questions.

5. (a) Define types of yield. How do we calculate the percentage yield of a chemical reaction? 4
- (b) Calculate the mass of 1 dm^3 of NH_3 gas at 30°C and 1000 mm Hg pressure, considering ammonia is behaving ideally. 4
6. (a) What are metallic solids? Describe their properties. 4
- (b) Explain spontaneous and non spontaneous reactions describe four points which differentiate them. 4
7. (a) Derive the formula to calculate the energy of an electron in n th orbit using Bohr's model. 4
- (b) The solubility of CaF_2 in water at 25°C is found to be $2.05 \times 10^{-4}\text{ mol dm}^{-3}$. What is the value of K_{sp} at this temperature? 4
8. (a) Explain sp^2 -hybridization with suitable example. 4
- (b) Give four applications of electro-chemical series. 4
9. (a) Describe Beckmann's method for the measurement of freezing point depression with the help of diagram. 4
- (b) What is enzyme catalysis? Give one example. Also give any four characteristics of enzyme catalysis. 4