

Answer five questions, selecting at least one from each Group, in which Q.No. 1 is compulsory.

1. Explain any three of the following :
 - (a) PbCl_2 is stable but PbCl_4 is unstable.
 - (b) Difference between double salts and complex salts.
 - (c) Carbon tetrachloride is non-polar.
 - (d) Entropy of universe is gradually increasing.
 - (e) P-V adiabatic curve is steeper than P-V isotherm.

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2.
 - (a) Explain reduced phase rule equation and the terms involved.
 - (b) Describe phase diagram of (KI - H_2O) system. What is eutectic point ?
3.
 - (a) Find out relationship among P, V and T in adiabatic expansion of an ideal gas.
 - (b) Obtain expressions for C_p and C_v and their relationship for an ideal gas.
4.
 - (a) Explain reversible and irreversible processes and thermodynamic equilibrium.
 - (b) What do you mean by perfect differentials ? Explain.
5. Write notes on any two of the following :
 - (a) Vant's Hoff Equation
 - (b) Water System
 - (c) Criteria of thermodynamic equilibrium and feasibility.

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6. Draw M.O. diagram of CO. Discuss its bond order and magnetic behaviour.
7. Discuss the chemistry of Co or Cr w.r.t. the following :
 - (a) Position in P.T.
 - (b) Occurrence and extraction
 - (c) Important oxidation states
 - (d) Analytical test
8.
 - (a) Give one important ore for the extraction of fluorine.
 - (b) How is fluorine extracted and stored ?
9.
 - (a) Discuss the isomerism in complex compounds.
 - (b) Give IUPAC name of following compound :
 - (i) $[\text{Cu}(\text{en})_2 \text{Cl}_2]$
 - (ii) $[\text{Fe}(\text{H}_2\text{O})_5 \text{NO}]\text{SO}_4$
10. Write short notes on any three of the following :
 - (a) Chromyl chloride test
 - (b) Pollutants of water
 - (c) Setting of cement
 - (d) Lewis concept of acids and bases