

CHEMISTRY (Subjective) GROUP - II

Time: 02:40 Hours Marks: 68

SECTION - I**2. Write short answers of any EIGHT parts.**

16

- (i) Define gram atom. Give example.
- (ii) How many molecules are present in 3.6 gram of H_2O ?
- (iii) Mg atom is twice heavier than that of carbon atom. How?
- (iv) Define Charles's Law. Give its mathematical form.
- (v) What is the physical significance of van der Waals' constants "a" and "b". Give their units.
- (vi) Write any two applications of plasma.
- (vii) Justify that the distance gaps between different orbits go on increasing from the lower to the higher orbits.
- (viii) Why the positive rays are called canal rays?
- (ix) Calculate mass of electron by using e/m value.
- (x) Define exothermic reaction. Give example.
- (xi) What are spontaneous and non-spontaneous reactions? Give example.
- (xii) Prove that: $q_p = \Delta H$

3. Write short answers of any EIGHT parts.

16

- (i) Give any two qualities of an ideal solution.
- (ii) Prove that: $\frac{\Delta p}{p^0} = x_2$
- (iii) What is meant by liquids practically immiscible?
- (iv) What is meant by catalytic poisoning?
- (v) Define rate of reaction. Give its units.
- (vi) How order of reaction is determined by a method of large excess?
- (vii) What is solvent extraction?
- (viii) How moderate cooling is advantageous over slow cooling in crystallization process?
- (ix) What is the significance of distribution coefficient in chromatography?
- (x) Ice floats over water. Justify it.
- (xi) Show hydrogen bonding in alcohol and water.
- (xii) Define liquid crystals with an example.

4. Write short answers of any SIX parts.

12

- (i) Why 2nd ionization energy value is greater than 1st?
- (ii) Define bond energy. Give example.
- (iii) Draw molecular orbital diagram of nitrogen molecule.
- (iv) Define solubility product.
- (v) State Le-Chatelier's principle.
- (vi) Justify that chemical equilibrium is dynamic in nature.
- (vii) Write two functions of salt bridge.
- (viii) Define electrode potential.
- (ix) What is meant by E.M.F of cell?

SECTION - II Attempt any THREE questions. Each question carries 08 marks.

5. (a) What is combustion analysis? How the percentages of various elements present in an organic compounds are determined? 04
- (b) What pressure is exerted by a mixture of 2.00g of H_2 and 8.00g of N_2 at 273K in a $10dm^3$ vessel? 04
6. (a) Describe the measurement of vapour pressure by manometric method with diagram. 03,01
- (b) How the enthalpy of combustion of substance can be measured by bomb calorimeter. Explain with diagram. 03,01
7. (a) Define and explain: (i) Atomic emission spectrum (ii) Atomic absorption spectrum 04
- (b) $N_2(g)$ and $H_2(g)$ combine to give $NH_3(g)$. The value of K_c in this reaction at $500^\circ C$ is 6.0×10^{-2} . Calculate the value of K_p for this reaction. 04
8. (a) Define hybridization and explain hybridization in NH_3 . 01,03
- (b) Write note on alkaline battery. 04
9. (a) Differentiate between hydration and hydrolysis. Describe with two examples in each case. 02,02
- (b) How does the Arrhenius equation help us to calculate the energy of activation of a reaction. 04