

CHEMISTRY (Subjective) GROUP - I

Time: 02:40 Hours Marks: 68

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

16

- What are ions? Under what conditions are they produced?
- What is the justification of two strong peaks in the mass spectrum of bromine, while for iodine only one peak at 127amu is indicated?
- What is the atomic mass unit? Give its value in grams.
- What is the physical significance of van der Waals' constants 'a' and 'b'? Give their units.
- Define pressure and give its two units.
- How absolute zero is explained by drawing graph?
- What is the origin of line spectrum?
- Define Moseley's law. Write importance of Moseley's law.
- Differentiate between Stark and Zeeman effects.
- Why burning of a candle is a spontaneous process?
- Differentiate between internal energy and enthalpy.
- What is thermochemical equation? What information do they convey?

3. Write short answers of any EIGHT parts.

16

- Define molarity. Give its formula.
- Define critical solution temperature. Give its value for water-aniline system.
- What are liquids practically immiscible? Give one example.
- Define order of reaction. Give example of second order reaction.
- What is electrical conductivity and dilatometric method for determination of rate of reaction?
- What is negative catalyst and autocatalyst? Give one example of each.
- What is gooch crucible? For what type of crystals, it is used?
- What is ether extraction?
- What is partition chromatography and adsorption chromatography?
- Why iodine is solid while fluorine and chlorine are gases?
- How decomposition of a sensitive liquid can be avoided?
- Define unit cell. What are unit cell dimensions?

4. Write short answers of any SIX parts.

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- Define ionization energy and electron affinity.
- Why the bond angle of H_2O and NH_3 are not 109.5° like that of CH_4 although O and N atoms are sp^3 hybridized?
- What is octet rule? Give example.
- Define law of mass action.
- What happens to the directions of a reversible reaction? When the ratio of concentration is less than actual K_c ?
- Why the solubility of glucose in water is increased by increasing the temperature?
- What is salt bridge? Give example.
- How does electrochemical series tells us the distinction between the oxidizing and reducing agents?
- Why the product of electrolysis in molten electrolyte are different from the products of electrolysis in the solution state?

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

- Write a note on limiting reactant. Explain it giving at least two examples. 02,01,01
 - 250cm³ of the sample of hydrogen effuses four times as rapidly as 250cm³ of an unknown gas. Calculate the molar mass of unknown gas. 04
- What are London dispersion forces? Give factors affecting them specially for halogens and hydrocarbons. 02,02
 - Describe the measurement of enthalpy of a reaction by bomb calorimeter with diagram. 03,01
- How $\frac{e}{m}$ value of electron was measured by J.J. Thomson? 04
 - The solubility of PbF_2 is 0.64 g/dm³. Calculate K_{sp} of PbF_2 . Atomic mass of Pb = 207, F = 19. 04
- Write the four postulates of "VSEPR" theory. 04
 - Explain four industrial applications of electrolysis. 04
- Describe Raoult's law. Explain when both the components are volatile. 04
 - Describe homogeneous and heterogeneous catalysis. 04