

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 and gram formula.
- (ii) 2g H₂, 16g CH₄, 44g CO₂ occupy same volume. Why?
- (iii) How efficiency of chemical reaction be expressed?
- (iv) How crystals are derived by using filter paper?
- (v) Why there is need to crystallize crude products?
- (vi) State Joule-Thomson effect.
- (vii) H₂ and He cannot be liquefied by Lind's method. Why?
- (viii) Define the terms critical temperature and critical pressure.
- (ix) Give general principle of liquefaction of gasses.
- (x) Relative lowering in vapour pressure is independent of temperature. Explain.
- (xi) Define hydrates. How are they formed?
- (xii) Why hydration energy of Mg²⁺ ion is higher than Na⁺ ion?

3. Write short answers of any EIGHT parts.

16

- (i) Define dipole-dipole forces. Give examples.
- (ii) What is polarizability? How it affects London dispersion forces?
- (iii) HF is a weaker acid than HCl, HBr, HI. Justify it.
- (iv) Why evaporation causes cooling?
- (v) Write any two properties of positive rays.
- (vi) Calculate the mass of electron with help of e/m.
- (vii) Write two defects of Rutherford atomic model.
- (viii) What is continuous spectrum? Give example.
- (ix) Differentiate between reversible and irreversible reaction.
- (x) How direction of reaction is determined by K_c?
- (xi) Define average and instantaneous rate of reaction.
- (xii) Describe specific rate constant or velocity constant of a reaction.

4. Write short answers of any SIX parts.

12

- (i) 75.4pm is compromise distance between two hydrogen atoms. Justify it.
- (ii) Why dipole moment of CO₂ is zero but that of CO is 0.12D?
- (iii) Why energy of antibonding molecular orbitals are greater than that of bonding molecular orbitals?
- (iv) Discuss the trend of ionization energy in periodic table.
- (v) Describe spontaneous process. Give an example.
- (vi) Define enthalpy of atomization. Give an example.
- (vii) Lead accumulator is a chargeable battery. Justify.
- (viii) Give difference between electrolytic and voltaic cell.
- (ix) How copper can be purified?

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

5. (a) Define actual yield and theoretical yield. Why the actual yield is lesser than theoretical yield? Also give the formula to calculate the percent yield.

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(b) Write four properties of covalent solids.

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6. (a) Calculate the density of CH₄ at 0°C and one atmospheric pressure.

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(b) Derive radius of revolving electron in nth orbit of H-atom on the basis of Bohr's atomic model.

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7. (a) Explain the structure of the given compounds with the help of V.S.E.P.R theory (i) NH₃ (ii) H₂O

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(b) How do you measure the heat of combustion of substance by Bomb Calorimeter?

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8. (a) N₂(g) and H₂(g) combine to give NH₃(g). The value of K_c in this reaction at 500°C is 6.0 × 10⁻².

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Calculate the value of K_c for this reaction.

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(b) Discuss any four factors which influence the rates of chemical reactions.

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9. (a) Write the rules for assigning oxidation number to an element in a compound

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(b) How is lowering in vapour pressure as colligative property used to find out molecular mass of solutes?

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