

GENERIC ELECTIVE- I,III

1 mark Qns.

- i. Why it is stated that entropy of the system is increasing?
- ii. The ΔG at boiling point of water liquid is zero. Explain?
- iii. In Haber's process for the synthesis of ammonia, _____ is used as the catalyst?
- iv. Which factors affect the equilibrium constant?
- v. What happens to the ionic product of water if some acid or base is added to water?
- vi. What is the value of pK_w ?
- vii. Silver chloride is less soluble in sodium chloride solution than in water, explain?
- viii. How can you prepare benzene by decarboxylation method?
- ix. What is the electrophile during Friedel-Craft's acylation reaction?
- x. What are aromatic compounds?

1.5 Mark Qns.

- i. What is Gibbs-Helmholtz equation?
- ii. What is the relationship between ΔH and ΔS for a process at equilibrium?
- iii. Give a difference between an isothermal and adiabatic process?
- iv. What do you understand by chemical equilibrium? Give its characteristics?
- v. Define and explain solubility products?
- vi. Differentiate between ionic product and solubility product?
- vii. Why benzene prefer electrophilic substitution reaction?
- viii. How can you prepare acetophenone from benzene?
- ix. What is the role of $AlCl_3$ in Friedel-Craft's reaction?
- x. Why para chloro-benzene has higher melting point than ortho chloro-benzene?

2 Marks Qns.

- i. Calculate the heat of formation of benzene at $25^\circ C$ if the heat of combustion of benzene, carbon and hydrogen are -3267.62 , -393.51 and 2858.5 KJ respectively?

- ii. Calculate the heat of formation of glucose, given that the heat of formation of CO_2 , H_2O and glucose are -393.5 , -286.0 and $-1169.3 \text{ KJ Mole}^{-1}$ respectively?
- iii. Why clothes dry quickly when there is breeze?
- iv. 1 mole of PCl_5 was taken in 1 lit. flask and heated at 300K to establish equilibrium when 50% of PCl_5 dissociates into PCl_3 and Cl_2 . Calculate the equilibrium constant of the reaction?
- v. Write down the general characteristics of entropy?
- vi. The solubility of sparingly soluble metal halide MX_2 in water is $0.0001 \text{ Mol. dm}^{-3}$. What is its solubility product?
- vii. Calculate the pH of a solution prepared by mixing 20ml. of 0.1M NaOH to 40 ml. of $0.2\text{M CH}_3\text{COOH}$. (pK_a of $\text{CH}_3\text{COOH} = 4.74$)
- viii. What do you mean by buffer capacity?
- ix. Define ionic product of water?
- x. How can you distinguish between benzene and toluene?

6 Marks Qns.

- i. What is a thermochemical equation? Give one example. What information does it convey?
- ii. What is Le-Chateliers principle and how it is applied in case of manufacture of ammonia?
- iii. How is the concept of solubility product used in qualitative analysis?
- iv. Write a brief note about common ion effect and its applications?
- v. How does benzene react with (a) Cl_2 in presence of FeCl_3 , (b) Conc. HNO_3 , (c) Conc. H_2SO_4 , (d) CH_3Cl in anhydrous AlCl_3 .
- vi. Discuss briefly elimination and addition reaction in haloarenes with mechanisms?
- vii. How can you prepare ethyl bromide from alcohol? How does it react with sodium alkoxide, NH_3 , silver salt?