2024
(Session : 2022-26)

Time : 3 hours

Full Marks : 60

Candidates are required to give their answers in their own words as far as practicable.

The figures in the margin indicate full marks.

Answer from both the Groups as directed.

Group – A
(Compulsory)

1. Answer the following questions : 1×10 = 10

   (a) Write structural formula of phenol.

   (b) For a reaction to be feasible ΔG should be _____.

   (c) Constructive interference of molecular orbitals gives _____ molecular orbitals.

(d) What is pH scale ?

(e) Write structural formula of 2-methyl-2-propanol.

(f) Give one example of aryl halide.

(g) What is the bond order of N_2 ?

(h) Write expression for the solubility product for the given equation .

$$Ag_2SO_4\,(s) \rightleftharpoons 2Ag^+ + SO_4^{2-}$$
(in solution)

(i) What are ethers ?

(j) Write IUPAC name of acetone.

2. What is degree of ionization ? Write factors affecting degree of ionization. 5

Group – B

Answer any **three** questions of the following :

3. (a) What is Le Chateliers's principle ? 7

(b) Establish the relationship between K_p and K_c for ideal gases. 8

4. (a) Explain Valance Bond Theory and Molecular Orbital Theory. 7

(b) Draw molecular orbital diagram of CO and calculate its bond order. 8

5. (a) Explain S_N1 and S_N2 reactions. Give energy profile diagrams. 6

(b) Write one method of preparation of 1°, 2° and 3°, alcohol using Grignard Reagent. 9

6. Write notes on any **three** of the following : 5×3 = 15

(a) Reimer-Tiemann Reactions

(b) Aldol condensation

(c) Williamson's ether synthesis

(d) Oppeneauer Oxidation

7. (a) Aryl halides are less reactive than alkyl halides. Explain. 7

(b) Describe the benzyne mechanism for nucleophilic aromatic substitution reaction. 8

8. Write short notes on any **three** of the following :

5×3 = 15

(a) Halogenation of Phenol

(b) Iodoform Test

(c) Buffer solution

(d) Common ion effect