

**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.*

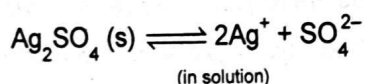
*The figures in the margin indicate full marks.*

*Answer from both the Groups as directed.*

**Group – A****(Compulsory)**

1. Answer the following questions :  $1 \times 10 = 10$ 
  - (a) Write structural formula of phenol.
  - (b) For a reaction to be feasible  $\Delta G$  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 .



- (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 Chatelier's principle ? 7
- (b) Establish the relationship between  $K_p$  and  $K_c$  for ideal gases. 8

KW – 41/2

(2)

Contd.

4. (a) Explain Valence 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  $1^\circ$ ,  $2^\circ$  and  $3^\circ$  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

KW – 41/2

(3)

(Turn over)

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

