

**2023**

**Time - 3 hours**

**Full Marks - 60**

*Answer all groups as per instructions.  
Figures in the right hand margin indicate marks.*

**GROUP – A**

1. Fill in the blanks. (all) [1 × 8
- (a) Viscosity is a \_\_\_\_\_ property. (extensive / intensive)
- (b) A basic buffer is prepared by mixing \_\_\_\_\_ and  $\text{NH}_4\text{OH}$ .
- (c) When the system does not exchange heat with the surroundings, the process is called \_\_\_\_\_.
- (d) With increase in temperature, pH \_\_\_\_\_.
- (e) The hybridisation of C-atom in benzene is \_\_\_\_\_.
- (f) The electrophile during sulfonation of benzene is \_\_\_\_\_.
- (g) The structure of pinacole is \_\_\_\_\_.
- (h) The reagents used for Wolff Kishner reduction \_\_\_\_\_.



[ 4 ]

GROUP – D

Answer all questions.

4. Write notes on :

[3 × 2

(a) Bond energy

(b) Integral enthalpy of solution

OR

State the law of chemical equilibrium. How can it be derived on thermodynamic consideration ? [6

5. Define buffer solution and derive Henderson's equation for acidic and basic buffer solutions. [6

OR

Write notes on :

[3 × 2

(a) Common ion effect

(b) Ionic product of water

6. (a) Discuss the mechanism of formation of chloro benzene from benzene. [4

(b) What are the limitations of Friedel Craft's alkylation ? [2

OR

[ 5 ]

(a) Discuss the benzyne mechanism for nucleophilic aromatic substitution reaction. [4

(b) Differentiate between  $SN^1$  and  $SN^2$  reactions. [2

[3 × 2

7. Write notes on :

(a) Pinacol-Pinacolone rearrangement

(b) Benzoin condensation

OR

Describe any two methods of preparation of phenol and write Reimer-Tiemann reaction with mechanism. [6