(1) Question No. 1 is **compulsory**.

(2) Attempt any **four** questions out of remaining **six** questions.

1. Answer any four :— **20**
   - (a) Explain the term Effective Atomic Number with suitable examples.
   - (b) How do you distinguish between phenol and alcohol
   - (c) Explain Wagner-Meerwin rearrangement
   - (d) Give two methods for the preparation of phthalic acid
   - (e) Write IUPAC names of the following co-ordination compounds
     - (i) $K_3[Al(C_2O_4)_3]$ (ii) $[Cr\,cl_3(NH_3)_3]$
   - (f) Write chemical formula of the following compounds.
     - (i) Aluminium potassium sulphate-12-water
     - (ii) Pentamine chloro chromium (III) bromide.

2.
   - (a) What are lanthanides and actinides ? Explain their properties with reference to **10**
     - (i) Electronic configuration   (ii) Colour and spectra.
   - (b) Explain magnetic behaviour of $[Co(NH_3)_6]^{+3}$ and $[CoF_6]^{-3}$. **5**
   - (c) Write note on Wer-ners co-ordination theory. **5**

3.
   - (a) What is CFSE ? Calculate CFSE for d^1, d^5 and d^9 in octahedral complexes. **10**
   - (b) Explain preparation properties and structure of N_2O_5. **5**
   - (c) What are the drawbacks of CFT ? **5**

4. Write notes on (any four) :— **20**
   - (a) Cis-trans-isomerism in $[CoCl_2(NH_3)_4]^+$
   - (b) Preparation, properties and uses of $X_e F_4$.
   - (c) Structures of SF_4 and PCl_5 on the basis of VSEPR
   - (d) Polymers of Boron
   - (e) Magnetic behaviours of $[Fe(CN)_6]^{-4}$ and $[Fe\uparrow(CN)_6]^{-3}$

5.
   - (a) Give any two methods for the preparation of Benzylalcohol. **5**
   - (b) Explain following reactions with their mechanism and applications. (any **three**) :— **15**
     - (i) Hoffmann Elimination
     - (ii) Dickmann Condensation
     - (iii) Cannizarro-reaction
     - (iv) Aldol - condensation.

6.
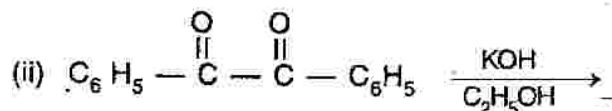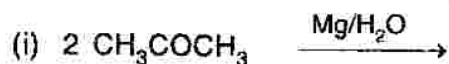   - (a) Give any two methods of preparation of : **10**
     - (i) Picnic acid
     - (ii) Benzophenone.
   - (b) Explain formation and structure of free radicals. **5**
   - (c) How phenol is converted into : **5**
     - (i) Ortho and Parabromophenol
     - (ii) Cyclohexanol.

7.
   - (a) Complete following reaction and predict suitable mechanism. **10**
     - (i) $2\ CH_3COCH_3 \xrightarrow{Mg/H_2O}$
     - (ii) $C_6H_5 - \overset{\overset{O}{\|}}{C} - \overset{\overset{O}{\|}}{C} - C_6H_5 \xrightarrow[C_2H_5OH]{KOH}$
   - (b) Distinguish between singlet carbene and triplet carbene. **5**
   - (c) Give manufacturing methods for oxalic acid and benzoic acid. **5**