Note: Section I is compulsory. Attempt any THREE (3) questions from Section II.

SECTION – I

2. Write short answers to any EIGHT questions. **(2 x 8 = 16)**

i. Why the ionic radii of negative ions are larger than the size of their parent atoms? Give example.

ii. Give two defects in Mendeleev's periodic table.

iii. Why transition elements have variable oxidation states?

iv. $KMnO_4$ acts as oxidizing agent? Justify with two examples.

v. Write the chemistry of setting of cement in first twenty four hours.

vi. Alkali metals give ionic hydrides. Give reason.

vii. Write the formula of (a) Asbestos (b) Halite

viii. What is the excellent method to prepare Alkyl Iodide?

ix. What is terpolymer? Give one example.

x. What are the monosaccharides? Give one example.

xi. Compare the compound protein with derived protein.

xii. How Grignard reagent reacts with "HCHO"?

3. Write short answers to any EIGHT questions. **(2 x 8 = 16)**

i. What is aqua regia? How does it dissolve gold?

ii. NO_2 is oxidizing agent. Prove it with two suitable examples.

iii. Arrange the oxidizing power of following with reason: F_2 , Cl_2 , Br_2 , I_2

iv. Why I_2 is solid while F_2 is gas?

v. Define functional group with any two examples.

vi. Differentiate between metamerism and position isomerism, with suitable examples.

vii. How oxalic acid is prepared from acetylene?

viii. Why ethyne is less reactive than ethene?

ix. Why alkanes are called as paraffins?

x. What are leachate?

xi. Define Biochemical Oxygen demand.

xii. What is lithosphere?

4. Write short answers to any SIX questions. **(2 x 6 = 12)**

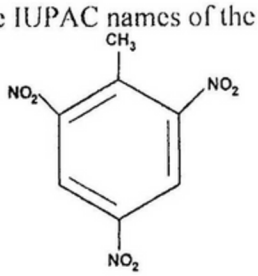
i. How to prepare borax from coleminte?

ii. Give two important uses of silicates.

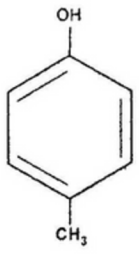
iii. What is white lead? Give its use.

iv. Write IUPAC names of the following molecules

a)



b)



v. Ethyl alcohol is a liquid while methyl chloride is a gas, justify it.

vi. Give the reaction of phenol with:
(a) Zn (b) HNO_3

vii. How acetaldehyde reacts with the following reagents?
(a) HCN (b) I_2/NaOH

viii. What is vinegar and give its use?

ix. Write down the mechanism of reaction between acetic acid and methanol.

SECTION – II

5. **(a)** What is hydration energy? Give one example. Discuss its variation in groups and periods of periodic table. **(1+1+2=4)**

(b) Write down any eight uses of lime in industry. **(4)**

6. **(a)** Give the reactions of Bleaching powder with **(4)**
i. dil H_2SO_4 ii. HCl
iii. NH_3 iv. CO_2

(b) Describe the process of digestion of paper pulp in Neutral Sulphite chemical process. **(4)**

7. **(a)** What are organic compounds? Describe the following terms (give one example for each). **(4)**
i. Alicyclic Compounds
ii. Aromatic Compounds
iii. Heterocyclic Compounds

(b) Write down the chemical reaction of Ethyl Magnesium Bromide with CO_2 , HCHO , Acetone and Epoxide. **(4)**

8. **(a)** Explain acidic nature of alkyne in detail by giving two examples. **(4)**

(b) What is aldol condensation? Give its mechanism. **(4)**

9. **(a)** Discuss catalytic oxidation of Benzene. **(4)**

(b) How ethers are prepared from following? **(4)**
i. Williamsons Synthesis ii. Ag_2O