

Roll No.

Total Pages : 03

GSQ/M-20

1751

CHEMISTRY

Paper XVIII

CH-304

Inorganic Chemistry

Time : Three Hours]

[Maximum Marks : 27

Note : Attempt *Five* questions in all, selecting at least *two* questions from each Section.

Section A

1. (a) Discuss in brief Bonding in Metal-Carbonyls. 2
(b) Give any *three* methods of preparation of Organo-Lithium compounds. 2
(c) Give IUPAC names of the following :
 - (i) $[\text{Ni}(\text{C}_5\text{H}_5)_2]$
 - (ii) $[(\text{CO})_5 \text{Mn}-\text{Mn}(\text{CO})_5]$. 1½

2. (a) Discuss the factors responsible for metal-carbon bond cleavage in organometallic compounds. 2
(b) Explain 3C—2e bond in tri-alkyl aluminium compounds. 2

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- (c) Complete the following reactions : 1½
- (i) $\text{AlR}_3 + \text{SnCl}_4 \rightarrow \dots\dots\dots$
- (ii) $\text{HgX}_2 + 2\text{R-MgX} \rightarrow \dots\dots\dots$
3. (a) Discuss Lawis concept of Acids and Bases. 2
- (b) Explain the feasibility of the following reaction on the basis of HSAB principle : 2
- $\text{LiI} + \text{CsF} \rightarrow \text{LiF} + \text{CsI}$
- (c) Why, BF_3 is less acidic than BCl_3 ? 1½
4. (a) What is relationship of Electronegativity with Hardness and Softness ? 2
- (b) How does HSAB principle govern occurrence of minerals ? 2
- (c) What are conjugate acid-base pairs ? 1

Section B

5. (a) What is the role of alkali metals in biological system ? 2
- (b) What are Freelifing and Symbiotic bacteria ? 2
- (c) What are Porphyrins ? 1½
6. (a) What is the difference between N_2 fixation and nitrogen assimilation ? 2
- (b) What is Haemoglobin ? Give its functions. 2
- (c) Explain co-operativity effect in haemoglobin. 1½

7. (a) Explain Homomorphous and Heteromorphous π system in triphosphazene. 2
- (b) Why do Polyphosphazene chain prefer a cis-trans conformation to trans-trans conformation ? 2
- (c) What is Glass Transition Temperature ? 1
8. (a) How are cross-linked silicones prepared ? 2
- (b) Complete the following reactions : 2
- (i) $(\text{NCl}_2)_3 + 6 \text{NaF} \rightarrow \dots\dots\dots$
- (ii) $(\text{NCl}_2)_3 + 6\text{CH}_3\text{-Mg-I} \rightarrow \dots\dots\dots$
- (c) What are Polyphosphazenes ? 1½