

**B. Sc. DEGREE END SEMESTER EXAMINATION - MARCH 2025****SEMESTER 6 : CHEMISTRY****COURSE : 19U6CRCHE13: APPLIED INORGANIC CHEMISTRY (EL)***(For Regular 2022 Admission and Supplementary 2021/2020/2019 Admissions)*

Time : Three Hours

Max. Marks: 75

**PART A****Answer any 10 (1 mark each)**

1. The metal ion present in deoxy hemoglobin is.....
2. The sequence of electron transfer between cytochromes in a respiratory process depends on \_\_\_\_\_.
3. Total number of valence electrons in  $\text{Fe}(\text{C}_5\text{H}_5)_2$  is---?
4. Name the ores of Aluminium and Zinc.
5. Give an example for a pi-acceptor ligand.
6. What is glass transition temperature?
7. Give the relation between transmittance and absorbance.
8. What is the function of nitrogenase enzyme?
9. Name a catalyst used in alkene polymerization.
10. The reducing agent used in smelting is .....
11. Mention one example for homoatomic polymer?
12. EAN of  $\text{Mo}(\text{CO})_6$  is.....
13. Give the complex responsible for the reddish violet colour generated during the colorimetric determination of Chromium.

**(1 x 10 = 10)****PART B****Answer any 10 (2 marks each)**

14. What do you mean by transmittance?
15. What is smelting?
16. What is Mond process?
17. Prove  $\text{Fe}(\text{CO})_5$  obeys EAN rule?
18. Show the reaction mechanism of electrophilic substitution in Ferrocene?
19. Explain the cooperativity effect in hemoglobin.
20. What is molar extinction coefficient?
21. Draw the monomer structure of polysilanes and polysiloxanes?
22. Elaborate free volume theory and its relation with  $T_g$
23. What is oxidative refining?
24. What do you mean by competitive inhibition?
25. Consider the 18 electron rule as a guide and determine the value of n in the following complex.  
 $\text{Rh}(\eta^5\text{-C}_5\text{H}_5)(\text{CO})_n$
26. What are pi-acid ligands? Give two examples.

**(2 x 10 = 20)**

### **PART C**

**Answer any 5 (5 marks each)**

27. Write a note on deficiency of copper and zinc.
28. What are pi- acceptor ligands? Compare the pi-accepting abilities of  $\text{NO}^+$ , CO, and  $\text{CN}^-$
29. Briefly describe the structure and role of cytochrome oxidase in biological system.
30. What are organometallics? Give two examples of sigma-bonded organometallics.
31. Draw and explain the DTG curve for Calcium oxalate monohydrate.
32. Discuss in detail the thermodynamics of the oxidation of metal to metal oxides.
33. Differentiate between silicone fluids and silicone resins?
34. What is synergic effect in metal-alkene complexes?

**(5 x 5 = 25)**

### **PART D**

**Answer any 2 (10 marks each)**

35. Write the structure and properties of Ferrocene? Illustrate a) nitration b) bromination c) carboxylation and d) Friedel-Crafts reaction with ferrocene?
36. Explain the different metallurgical processes.
37. Write briefly on carbonyl clusters, halide clusters, and naked clusters.
38. Write a note on DSC.

**(10 x 2 = 20)**