

Reg. No

Name

23U674

B. Sc. DEGREE END SEMESTER EXAMINATION : MARCH 2023

SEMESTER 6 : CHEMISTRY

COURSE : 19U6CRCHE13 : APPLIED INORGANIC CHEMISTRY (EL)

(For Regular - 2020 Admission and Supplementary - 2019 Admission)

Time : Three Hours

Max. Marks: 75

PART A

Answer any 10 (1 marks each)

1. Predict which of the complexes $[\text{V}(\text{CO})_6]^-$, $\text{Cr}(\text{CO})_6$, $[\text{Mn}(\text{CO})_6]^+$ has the shortest C-O bond.
2. Give an example of a compound having metal-metal quadruple bond.
3. ----- is considered as the most toxic heavy metal in the environment.
4. Which heme containing enzyme is associated with detoxification of xenobiotics?
5. What is carboplatin?
6. The two ores which can be subjected to calcination are
7. In metallurgy, Cyanide process is employed for which metals?
8. η represents -----in organometallics
9. What is Ziegler - Natta Catalyst?
10. Define hybrid organic-inorganic polymer?
11. What are polyphosphazenes?
12. The reagent used for colorimetric determination of chromium is -----
13. Give the relation between transmittance and absorbance.

(1 x 10 = 10)

PART B

Answer any 10 (2 marks each)

14. Discuss the structure and hybridization in $\text{Fe}(\text{CO})_5$
15. Which one is having higher M-CO stretching frequency? $[\text{Ti}(\text{CO})_6]^{2-}$ or $\text{Cr}(\text{CO})_6$
16. Explain the cooperativity effect in hemoglobin.
17. Explain siderosis.
18. What is oxidative refining?
19. What are Ellingham diagrams?
20. What is electrometallurgy?
21. What is Vilsmeier reaction?
22. Illustrate the nitration mechanism on ferrocene?
23. Write three differences between T_g and T_m
24. What do you mean by glass transition temperature of a polymer?
25. How many exothermic and endothermic peaks can be observed for the DTA curve of Calcium oxalate monohydrate if the analysis is done in CO_2 ?
26. What is DTG? What is its advantage over TG?

(2 x 10 = 20)

PART C

Answer any 5 (5 marks each)

27. What are HNCCs? Predict the TEC, PEC, geometry and the cluster type of $[\text{Os}_6(\text{CO})_{18}]^{2-}$.
28. Discuss the structure and functions of myoglobin.
29. Write a note on anti cancer drugs.
30. Explain a) Leaching and b) Hydrometallurgy
31. What is EAN rule? Give one example each of organometallic compound in which EAN rule is (1) obeyed (2) not obeyed
32. Explain the structure and bonding in ferrocene
33. Explain five different properties of inorganic polymers
34. Describe the principle behind colorimetric analysis.

(5 x 5 = 25)

PART D

Answer any 2 (10 marks each)

35. Explain the synergic bonding in metal carbonyls. What are the different factors that influence the strength of M-CO bond?
36. Explain a) Smelting, b) Goldschmidt Thermite process, c) Zone refining, d) Froth flotation process
37. Define Zeise salt and illustrate its structure? Give one method of preparation and discuss the salient features
38. Write a note on DTA

(10 x 2 = 20)