

16U610

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Name:

Reg. No.

SIXTH SEMESTER B.Sc. DEGREE EXAMINATION, APRIL 2019

(Regular/Supplementary/Improvement)

(CUCBCSS-UG)

CC15U CHE6 B09 - INORGANIC CHEMISTRY IV

Chemistry - Core Course

(2015 Admission onwards)

Time: Three Hours

Maximum: 80 Marks

Part A

Answer *all* questions. Each question carries 1 mark.

1. What is known as calcination of ore?
2. Write the composition of bronze.
3. Transition metals show varying oxidation states. Why?
4. Name any one chemical process in which a transition metal act as a catalyst.
5. Write the IUPAC name for the complex: $K_3[Fe(CN)_6]$
6. Tetrahedral complexes do not show geometrical isomerism. Why?
7. Write some trace metals that are required for body metabolism.
8. Draw the structure of ferrocene.
9. What are metalloenzymes?
10. Write the chemical equation for the hydrogenation of alkenes with Wilkinson's catalyst.

(10 x 1 = 10 Marks)

Part B

Answer any *ten* questions. Each question carries 2 marks.

11. Explain the refining of Titanium.
12. What is Kroll's process?
13. Draw the structure of $K_2Cr_2O_7$ and find out the oxidation state of Cr in the molecule.
14. Write the electronic configuration Cr and Cu.
15. Write the molecular formula of the following co-ordination complexes:
a) tetrammineplatinum (II) tetrachloroplatinate (II) and b) potassium trisoxalatoferrate.
16. Draw the shapes and orientations of d-orbitals.
17. What is crystal field stabilization energy? Prove that CFSE is zero for d^5 (high spin) configuration.
18. Explain labile complexes with any one example.

19. What is the advantage of chelation therapy?
20. Explain 18-electron rule. Find out whether it is satisfied for $\text{Mn}(\text{CO})_5\text{Cl}$.
21. Explain the structure of Zeise's salt.
22. Why certain heavy metals like Pb and Hg are toxic?

(10 x 2 = 20 Marks)

Part C

Answer any *five* questions. Each question carries 6 marks.

23. a) What is Ellingham diagram? What are its uses?
- b) The free energy changes at 1200°C , for the formation of CO and ZnO are given below. Suggest whether Zincite (ZnO) can be reduced by coke at this temperature.



24. Write notes on electrometallurgy.
25. Most of the transition metals are coloured and has paramagnetic properties. Explain.
26. What are chelates? Draw the structure of a chelating ligand. Discuss its applications.
27. Discuss the crystal field splitting in octahedral and tetrahedral complexes.
28. Briefly explain the various factors that affect crystal field splitting.
29. Write the structure of any three anticancer drugs. What are its significances?
30. Write notes on the sodium-potassium pump in the body.

(5 x 6 = 30 Marks)

Part D

Answer any *two* questions. Each question carries 10 marks.

31. Explain the various methods used for the refining of metals.
32. a) Discuss the preparation, structure and uses of KMnO_4 **(6 marks)**
- b) Write the steps involved in the isolation of lanthanides from monazite. **(4 marks)**
33. Briefly explain the stereoisomers of co-ordination compounds with co-ordination numbers 4 and 6
34. Explain:
 - a) Oxygen transport mechanism in human body. **(5 marks)**
 - b) Zeigler Natta polymerization of alkenes. **(5 marks)**

(2 x 10 = 20 Marks)
