

B.Sc. DEGREE (C.B.C.S.S.) EXAMINATION, OCTOBER 2011**Fifth Semester****Core Course—CHEMISTRY OF D AND F BLOCK ELEMENTS**

(Common for B.Sc. Chemistry Model I and Model II, B.Sc. Petrochemicals and
B.Sc. Chemistry Environment and Water Management)

Time : Three Hours

Maximum Weight : 25

Section A*Answer all questions.**A bunch of four questions carries a weight of 1.*

- I. 1 Which is stabler Cu^+ or Cu^{2+} ?
- 2 IUPAC name of $[\text{Cr}(\text{H}_2\text{O})_4\text{Cl}_2]\text{Cl}$ is _____.
- 3 One anticancer Drug is _____.
- 4 $[\text{Co Br}(\text{NH}_3)_5]\text{SO}_4$ and $[\text{Co SO}_4(\text{NH}_3)_5]\text{Br}$ are _____ isomers.
- II. 5 The Co-ordination number of Cobalt in the complex $[\text{Co Br}_2(\text{en})_2]\text{Cl}$ is _____.
- 6 Vitamin B_{12} contains _____ metal.
- 7 Zeigler Natta catalyst is _____.
- 8 π bonding is not involved in _____.
- (a) Ferrocene. (b) Dibenzene Chromium.
- (c) Zeisse's salt. (d) Grignard reagent.
- III. 9 In Europium _____ oxidation state is more stable.
- 10 The protein part of Haemoglobin is _____.
- 11 The Geometry of $[\text{Ni}(\text{CN})_4]^{2-}$ is _____.
- 12 Water gas is a mixture of _____.
- IV. 13 The colour of Tetrammine copper (II) sulphate is _____.
- 14 One metal alkene complex is _____.

Turn over

15 Spin only magnetic moment value of $[\text{MnCl}_4]^{2-}$ is ———.

16 Solution of TiCl_3 and TiCl_4 ; coloured one is ———.

(4 × 1 = 4)

Section B

Answer any five questions.

Each question carries weight of 1.

17. Zirconium resembles Hafnium in many properties—Give reason.
18. What is Chelate effect? Explain with suitable example.
19. How will you distinguish between $[\text{Co}(\text{NH}_3)_5\text{Br}]\text{SO}_4$ and $[\text{Co}(\text{NH}_3)_6]\text{SO}_4\text{Br}$?
20. Explain the position of Lanthanide in the periodic table.
21. Explain $\text{S}_{\text{N}}1$ substitution reaction of Square Planar Complexes.
22. What is EAN rule? Explain.
23. Can Lanthanum ion exist in +4 oxidation state? Justify your answer?
24. Tetrahedral metal complexes are always of high spin. Why?

(5 × 1 = 5)

Section C

Answer any four questions.

Each question carries a weight of 2.

25. Explain the catalytic properties of organometallic compounds.
26. Discuss on the stereoisomerism exhibited by Co-ordination compounds with suitable examples.
27. What do you mean by Trans effect? Explain its applications in detail.
28. Depict the structures of hexacyano ferrate (III) ion and any high spin complex of Cobalt.
29. How is Ferrocene prepared? Give an account of its structure.
30. Compare Lanthanides and actinides in terms of magnetic and spectral properties.

(4 × 2 = 8)

Section D

Answer any two questions.

Each question carries a weight of 4.

31. What is Crystal field theory? How does it differ from valence bond theory? How does it explain the magnetic properties of Co-ordinations Compounds?
32. Define organo metallic compounds. Discuss its classification in detail with examples for each class.
33. Discuss briefly on different types of metal clusters with examples for each.

(2 × 4 = 8)