

**B.Sc. DEGREE (C.B.C.S.S.) EXAMINATION, OCTOBER 2014****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 The electronic configuration of scandium is \_\_\_\_\_.
- 2 IUPAC name of  $[\text{Pt Cl}(\text{NO}_2)(\text{NH}_3)_4]\text{SO}_4$  is \_\_\_\_\_.
- 3 The trialkyl aluminium compounds are generally \_\_\_\_\_.
- 4 Clusters without ligands are called \_\_\_\_\_.
- II. 5 Paramagnetism arises from the presence of \_\_\_\_\_.
- 6 The co-ordination number of cobalt in the complex  $[\text{Co Br}_2(\text{cn})_2]\text{Cl}$  is \_\_\_\_\_.
- 7 In dibenzene chromium the hapticity of the ligand is \_\_\_\_\_.
- 8 Both deoxymyoglobin and deoxyhaemoglobin are paramagnetic due to the presence of \_\_\_\_\_.
- III. 9 \_\_\_\_\_ is an example of hexa dentate ligand.
- 10 Hexafluorocobalt (III) ion is a \_\_\_\_\_ complex.
- 11 One metal alkene complex is \_\_\_\_\_.
- 12 The oxidation state of Re in  $[\text{Re}_2\text{Cl}_8]^{2-}$  is \_\_\_\_\_.
- IV. 13 The actinide elements exhibits colors due to \_\_\_\_\_.
- 14 The colour of tetramine copper (II) sulphate is \_\_\_\_\_.
- 15 Oxidation state of a metal in metal carbonyl is \_\_\_\_\_.
- 16 The enamel on teeth is a double salt of \_\_\_\_\_.

(4 × 1 = 4)

**Turn over**

**Section B**

*Answer any five questions.  
Each question carries a weight of 1.*

- 17 The transition elements have a small tendency to react. Give one reason.
- 18 What is Co-ordination number ?
- 19 Define crystal field stabilization energy.
- 20 State John-Teller effect.
- 21 Give one example for LNCC cluster.
- 22 What is a fluxional molecule ?
- 23 What are metallo-enzymes ?
- 24 Absorption spectra of actinides consists of sharp lines. Give reason.

(5 × 1 = 5)

**Section C**

*Answer any four questions.  
Each question carries a weight of 2.*

- 25 Explain the role of haemoglobin.
- 26 Give the method of preparation and properties of any one mononuclear carbonyl.
- 27 How is water gas synthesized ? Explain.
- 28 What are high spin and low spin complexes ?
- 29 What do you mean by trans effect ? Explain its applications.
- 30 Why do transition metals show variable valency ?

(4 × 2 = 8)

**Section D**

*Answer any two questions.  
Each question carries a weight of 4.*

- 31 Discuss the optical isomerism exhibited by complexes of co-ordination numbers 4 and 6.
- 32 Discuss briefly on different types of metal clusters with examples for each.
- 33 Explain the role of alkali and alkaline earth metals in biological system.

(2 × 4 = 8)