

## SIXTH SEMESTER B.Sc. DEGREE EXAMINATION, MARCH 2013

(CCSS)

Chemistry

## CH 6B 15—INORGANIC CHEMISTRY—II

Time : Three Hours

Maximum : 30 Weightage

I. Answer all the *twelve* questions. Each question carries a weightage of  $\frac{1}{4}$ . This section contains multiple choice, fill in the blanks and one word answer type questions :

- 1 Write an example for hexadentate ligand.
- 2 The oxidation number of Fe in  $K_4[Fe(CN)_6]$  is \_\_\_\_\_.
- 3  $K_3[CoF_6]$  is high spin complex. The hybrid state of Co atom in the complex is :  
(a)  $sp_3d$ . (b)  $sp^3d^2$ .  
(c)  $d^2sp^3$ . (d)  $dsp^2$ .
- 4 In the complex  $Fe(CO)_x$ , the value of  $x$  is \_\_\_\_\_.
- 5 Out of the following metals, which forms polynuclear carbonyl ?  
(a) Na. (b) Mg.  
(c) Mn. (d) Al.
- 6 The colour of  $[Ti(H_2O)_6]^{3+}$  is due to \_\_\_\_\_.
- 7 The basic unit of porphyrine is \_\_\_\_\_.
- 8 Carbon nanotubes were first found in the cathode deposits obtained in the arc evaporation of \_\_\_\_\_.
- 9 Write the preparation of  $S_2N_2$ .
- 10 Complete the following equation :  $2CaO + SiO_2 \rightarrow$  \_\_\_\_\_.
- 11 What is the substance used to slowdown the setting of cement ?
- 12 Write the composition of soda glass.

(12  $\times$   $\frac{1}{4}$  = 3 weightage)

II. Answer *all* the *nine* questions. Each question carries 1 weightage :

- 13 What is an ambidentate ligand ?
- 14 Write the IUPAC name of  $[CoCl(NH_3)_5]^{2+}$ .

Turn over

- 15 Write the molecular geometry and hybridized state of  $[\text{Ni}(\text{CN})_4]^{2-}$ .
- 16 What is Zeigler-Natta catalyst ?
- 17 Describe myoglobin.
- 18 What are cytochromes ?
- 19 How will you prepare boron nitride nanotubes ?
- 20 Illustrate the preparation of  $\text{Si}_3\text{N}_4$  nanowires.
- 21 What is annealing ?

(9 × 1 = 9 weightage)

III. Answer any *five* questions. Each question carries 2 weightage :

- 22 Draw the structure of complex  $[\text{SbF}_5]^{2-}$  and write the hybridization and geometry.
- 23 Draw and explain the crystal field splitting in an octahedral complex.
- 24 What are sandwich compounds? Explain.
- 25 Describe the applications of organo arsenic compounds in medicine.
- 26 Explain Sodium/Potassium pump .
- 27 Describe the applications of nanotechnology in catalysis.
- 28 Write a note on phosphate fertilizer.

(5 × 2 = 10 weightage)

IV. Answer any *two* questions. Each question carries 4 weightage :

- 29 Explain the structural isomerism in co-ordination compounds.
- 30 Illustrate the preparation, properties and structure of  $\text{S}_4\text{N}_4$ .
- 31 Describe the manufacture of Portland cement.

(2 × 4 = 8 weightage)