

SIXTH SEMESTER B.Sc. DEGREE EXAMINATION, MARCH/APRIL 2016

(UG—CCSS)

Core Course—Chemistry

CH6 B15—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 What is the ligancy of ethylene diamine ligand ?
- 2 Write the EAN of Fe in the complex $K_4 [Fe (CN)_6]$.
- 3 Tetraminecopper (II) ion is square planar complex with one unpaired electron. According to VB theory, the hybrid state of copper should be :
(a) sp^3 ; (b) sp^2 ; (c) dsp^2 ; and (d) sp^2d .
- 4 Hexafluoroferrate (III) ion is an outer orbital complex. The number of unpaired electrons present in it is _____.
- 5 Which of the following is not an example for organometallic compounds ?
(a) trimethyl boron. (b) trimethyl aluminium
(c) trimethoxy titanium chloride (d) tetracarbonyl nickel.
- 6 Write an example for π -bonded organo metallic compounds.
- 7 The porphyrin structure contains a central _____ membered ring.
- 8 TEM image of a part of an aligned nanotube bundle is obtained from the pyrolysis of the _____ mixture.
- 9 Write the chemical formula of Zeolite.
- 10 Complete the following equation :
 $4CaO + Al_2O_3 + Fe_2O_3 \rightarrow$ _____.
- 11 What is the other name of ordinary glass ?
- 12 What is hard glass ?

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

Turn over

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

- 13 What is a bridging ligand ?
- 14 Write the IUPAC name of $[\text{CoCl}(\text{NO}_2)(\text{en})_2]\text{Cl}$.
- 15 Write an example of a complex showing d^2sp^3 hybridization.
- 16 What is Zeise's salt ?
- 17 Write the photosynthesis reaction.
- 18 What is the function of haemoglobin and myoglobin ?
- 19 How will you prepare NbS_2 nanotubes ?
- 20 Describe the preparation of gallium nitride nanowire.
- 21 What is safety glass ?

(9 × 1 = 9 weightage)

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

- 22 Draw the structure of complex $[\text{Co}(\text{NH}_3)_6]^{3+}$ and write the hybridization and geometry.
- 23 On the basis of VB theory explain the hybridization of $[\text{Ni}(\text{CO})_4]$.
- 24 Write a note on the uses of organo mercury compounds in medicine.
- 25 Describe polynuclear metal carbonyls.
- 26 Explain the biochemistry of magnesium.
- 27 Illustrate the application of nanotechnology in nanoswitches.
- 28 Explain potash fertilizers.

(5 × 2 = 10 weightage)

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

- 29 Explain optical isomerism in co-ordination compounds.
- 30 Illustrate the preparation, properties and structures of different sulphides of phosphorus.
- 31 Write briefly about carbides and borides.

(2 × 4 = 8 weightage)