Kolhan University, Chaibasa

B.Sc. Semester-VI (6) Examination 2020

Chemistry B.Sc.(H)

Semester-VI

CC-13

Inorganic chemistry

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Full marks: 70 Time: 03hrs

General instructions:

Candidates are required to give their Answer in their own words as far Practicable. Their Figures in the margin indicate Full marks.

Group-A

Answer all questions: $10 \times 2 = 20$

1. Fill in the blanks:

(i) The colour of d-block compounds is due to .....

(ii) $\mu_{eff} = \sqrt{n(n+\text{---})}$ BM

(iii) Ethylene diamine (en) is a ---- ligand.

(iv) $[Co(NH_3)_6]^{3+}$ is more stable than $[Co(NH_3)_6]^{2+}$ because of.....

(v) RMgX is an .....

(vi) IUPAC Name of $[Co(en)_3]^{3+}$ is .....

(vii) If absolute value of the spins of electrons is S, it's spin multiplicity would be .....

(viii) The geometry of $Fe(CO)_5$ is .....

(ix) EAN of $Mn_2(CO)_{10}$ is .....

(x) Phosphonitrilic compounds are also called.....

Group-B Answer any four Questions: $4 \times 5 = 20$

2. What is trans effect? Explain mechanism of substitution reactions in square planar complexes.

3. What is meant by stepwise stability constant and overall stability constant of a complex ion? Derive relationship between them.

4. Find out the relation of no. of unpaired electrons to magnetic susceptibility.

5. Explain the following: 3+2=5

(a) $[Fe(CN)_6]^{3-}$ is Paramagnetic while $[Fe(CN)_6]^{4-}$ is diamagnetic.

(b) $[Ni(CN)_4]^{2-}$ is diamagnetic and Square Planar.

(6). Write the various kinds of electronic transitions in transition metal complexes.

7. Discuss the Preparation and Properties of Zeise's salt. i.e. $K^+[PtCl_3\eta^2-C_2H_4]^-$

8. Explain with calculations that metal carbonyls $Fe_2(CO)_9$ and $Co_2(CO)_8$ Obey 18-electrons rule.

9. Compare between organic polymers and in-organic polymers.

Group-C

Answer any two Questions: 2×15 = 30

10. (a) What are Silicones ? Describe their methods of Preparation

(b) Define Phosphazenes. Give method of Preparation and Structure of triPhosphazene. 8+7=15

(11) (a) Discuss Orgel Diagram for d^1 and d^9 metal ions in their Octahedral transition metal Complexes. 8+7=15

(b) Explain Electronic Spectrum of $[Ti(H_2O)_6]^{3+}$ complex ion.

12. (a) Explain the factors affecting stability of complexes. 10+5=15

(b) Distinguish between cis- and trans-isomers of $[PtA_2X_2]^0$ type Complex.

13. Write short notes on the following:

(a) Ferrocene.

(b) Homogeneous Hydrogenation of olefins.

(c) Magnetic titrations 3×5=15

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Answer

1. (i) d-d transition.
(ii) Bidentate/cyclic/chelating
(iii) 2
(iv) High charge density of Co^{3+}
(v) Organo metallic compound.
(vi) Tris-(Ethylene diamine) cobalt (III)
(vii) 2S+1
(viii) Trigonal bi Pyramidal.
(ix) 18
(x) Phosphazenes.

Sugata
26/4/20

X