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SHIVAJI UNIVERSITY, KOLHAPUR

DATTAJIRAO KADAM ARTS, SCIENCE AND COMMERCE COLLEGE, ICHALKARANJI

B.Sc. (Part – II) (Semester – IV) (New) (CBCS)

Examination October, 2023

CHEMISTRY (Paper - VII)

DSC– D3: Inorganic Chemistry

Sub. Code: 78909

Day and Date: Wednesday, 08-11-2023 **Total Marks: 50**

Time: 10.30 a.m. to 12.30 p.m.

Instructions:
1) **All questions are compulsory.**
2) **Figures to the right indicate full marks.**
3) **Draw neat diagrams and give equations wherever necessary.**
4) **Use of Scientific calculator and logarithmic table is allowed.**

Q 1 A) Answer the following in one sentence. [05]

a) Define polydentate ligand.

b) Name the group reagent for group I.

c) What will be the resultant solution, if solubility product < ionic product.

d) If the central metal ion has $sp^3 d^2$ type hybridization then what will be the geometry of this metal complex?

e) Give the IUPAC name of $[Co(NH_3)_6]Cl_3$ complex.

B) Choose the most correct alternative for each of the following and rewrite the sentences. [05]

a) Name the group reagents for group II ----------.

i) HCl and H_2S ii) NH_4OH iii) NH_4Cl iv) Na_2CO_3

b) Highest oxidation state of Mn is ----------.

i)+5 ii) +6 iii) +7 iv)+ 4

c) d-block elements are also called as ----------.

i) inner transition ii) noble gas iii) alkali metals iv) transition elements

d) The atomic number of Nitrogen is ----------.

i) 5 ii) 7 iii) 8 iv)13

e) Co-ordinate bond is indicated by ----------.

i) small arrow ii) hyphen iii) small dash iv) dotted line

Q 2) Attempt any TWO of the following. [20]

a) What are boranes? How will you prepare diboranes? Discus structure of diborane in detail.

b) What is mean by chelation? Explain the application of chelation with reference to EDTA and DMG.

c) What are general characteristics of transition metals? Give the names, symbols and electronic structure of '3d' block elements (first transition series).

d) On the basis of VBT, explain the formation of $[FeF_6]^{3-}$ and $[Fe(CN)_6]^{3-}$ complexes.

Q.3) Answer any four of the following. [20]

a) Distinguish between primary valency and secondary valency.

b) Define co-ordinate bond and explain formation of co-ordinate bond with suitable example.

c) Write short note on spot test analysis.

d) Explain oxidation state of '3d' block elements.

e) What are allotropes? Explain structure of diamond.

f) Write short note on common ion effect.

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SHIVAJI UNIVERSITY, KOLHAPUR

DATTAJIRAO KADAM ARTS, SCIENCE AND COMMERCE COLLEGE, ICHALKARANJI

B.Sc. (Part – II) (Semester – IV) (New) (CBCS)

Examination March/April, 2023

CHEMISTRY (Paper - VII)

DSC– D3: Inorganic ChemistrySub.

Code: 78909

Day and Date: Wednesday, 14 -06-2023 **Total Marks: 50**

Time: 10.30 a.m. to 12.30 p.m.

Instructions:
1) **All questions are compulsory.**
2) **Figures to the right indicate full marks.**
3) **Draw neat diagrams and give equations wherever necessary.**
4) **Use of Scientific calculator and logarithmic table is allowed.**

Q 1 A) Answer the following in one sentence. [05]

a) Define Polydentate ligand ?

b) Name the group reagents for group I.

c) What will be the resultant solution, if solubility product < ionic product.

d) If the metal has $sp^3 d^2$ type hybridization then which type geometry of this metal complex

e) Give the IUPAC name of $[Co(NH_3)]Cl_3$

B) Choose the most correct alternative for each of the following and rewrite the sentences. [05]

a) Name the group reagents for group II ----------

a) HCl & H_2S b) KBr c) NH_4Cl d) Na_2CO_3

b) Highest oxidation state of Mn is ----------

a) +8 b) +6 c) +7 d)+ 9

c) d-block elements is called as ----------

a) alkali metal b) noble gas c) halogens d) transition elements

d) The atomic number of Nitrogen is ----------

a) 5 b) 7 c) 8 d) 13

e) Co-ordinate bond is indicated by ----------

b) small arrow b) hyphen c) small dash d) dotted line

Q 2) Attempt any TWO of the following. [20]

a) What are boranes? How will you prepare diboranes ? Discuss it's structure in detail.

b) What is Chelation? Explain the application of chelation with reference to EDTA and DMG.

c) What are general characteristics of transition metal and Give the electronic structure of 3d block elements (First transition series).

d) On the basis of VBT, explain the formation of $[FeF_6]^{3-}$ and $[FeF_6]^{3-}$

Q.3) Answer any four of the following. **[20]**

a) Distinguish between primary valency and secondary valency.

b) Define and explain co-ordinate bond with suitable example.

c) Explain oxidation state of 3d block elements.

d) Discuss the spot test analysis.

e) Write a note on common ion effect.

f) What are allotropes? Explain structure of diamond.

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DATTAJIRAO KADAM ARTS, SCIENCE AND COMMERCE COLLEGE, ICHALKARANJI

B.Sc. (Part – II) (Semester – IV) (New) (CBCS)

Examination March/April, 2023

CHEMISTRY (Paper - VII)

DSC– D3: Inorganic Chemistry

Sub. Code: 78909

Day and Date: Wednesday, 14 -06-2023 **Total Marks: 50**

Time: 10.30 a.m. to 12.30 p.m.

Instructions: 1) All questions are compulsory.
2) Figures to the right indicate full marks.
3) Draw neat diagrams and give equations wherever necessary.
4) Use of Scientific calculator and logarithmic table is allowed.

Q 1 A) Answer the following in one sentence. [05]

a) What are the ligands?

b) Give the IUPAC nomenclature of $[FeF_6]^{3-}$

c) Name the group reagents for group II.

d) When co-ordination number (C.N.) of metal is 6, what is the geometry of a complex?

e) What happens if solubility product < Ionic product ?

B) Choose the most correct alternative for each of the following and rewrite the sentences. [05]

a) Degree of dissociation of weak electrolyte NH_4OH is suppressed by adding strong electrolyte----------.

i) KCl ii) KBr

iii) NH_4Cl iv) Na_2CO_3

b) Highest oxidation state of Mn is ----------.

i) +8 ii) +7

iii) +6 iv) +9

c) General electronic configuration of group 14 or (IVA) is ----------.

i) ns^2np^6 ii) ns^2np^1

iii) ns^2np^2 iv) ns^2np^3

d) The transition elements belong to groups ----------.

i) 1 to 10 ii) 1 to 12

iii) 3 to 12 iv) 1 to 13

e) In borazine boron and nitrogen undergoes ---------- hybridization.

i) sp^3 ii) sp^2

iv) sp iv) sp^3d^2

Q 2) Attempt any TWO of the following. [20]

a) On the basis of VBT, explain the formation of outer orbital complex $[CoF_6]^{-3}$ and inner orbital complex $[Co(CN)_6]^{-3}$.

b) What is chelation ? Explain the applications of chelation with reference to EDTA and DMG

c) What are boranes? How will you prepare diborane? Discuss structure of diborane in detail.

d) What are transition elements? Explain characteristics of 3d-block elements with reference to i) oxidation state and ii) coloured ions.

Q.3) Answer any four of the following. [20]

a) Write short note on Spot test analysis.

b) Explain geometrical (cis-trans) isomerism when C.N.= 4.

c) Mention different allotropes of carbon. Explain properties and structure of diamond.

d) Give the points of distinction between metal chelate and metal complex.

e) Define and explain solubility product and common ion effect.

f) Give the points of distinction between primary valency and secondary valency