

(A-32) Seat No: _____

No. of Printed Pages : 2

50

SARDAR PATEL UNIVERSITY
B. Sc. (Semester-IV) EXAMINATION
Monday, 2nd May 2016

Subject: INORGANIC CHEMISTRY (US04CCHE01)
(UNDER CBCS) JUNE 2010 BATCH

Time: 2.30 pm To 5.30 pm

Total Marks: 70

Q-1 Multiple choice questions:

[10]

- The atomic radii decrease gradually from Sc to Mn, but from _____ these values remain practically constant.
(a) Co to Cu (b) Co to Zn (c) Fe to Zn (d) Fe to ~~Cu~~
- d-block elements lie in between _____ elements.
(a) s- and p-block (b) s- and f-block (c) p- and f-block (d) none of above
- Which of the following compound is not paramagnetic?
(a) $[\text{Zn}(\text{NH}_3)_4]\text{Cl}_2$ (b) $\text{K}_3[\text{TiF}_6]$ (c) $\text{Na}_3[\text{FeF}_6]$ (d) $[\text{Cr}(\text{H}_2\text{O})_4]\text{SO}_4$
- According to Werner's theory, metal atom in complex compounds exhibits _____.
(a) only primary valency (b) secondary valency
(c) both primary and secondary valency (d) none of above
- The number of ions present in $\text{K}_3[\text{Fe}(\text{CN})_6]$ are _____.
(a) 10 (b) 3 (c) 2 (d) 4
- The richest source of rare earth is _____.
(a) Monazite (b) Bastnaesite (c) Sea water (d) Xenotime
- _____ solvents have hydrogen atom in their formula.
(a) Acidic (b) Protogenic (c) Protogenic (d) Protophilic
- _____ is not hard base?
(a) NO_2^- (b) NO_3^- (c) NH_3 (d) CHCOO^-
- Which of the following metallic carbonyl is not diamagnetic?
(a) $[\text{Co}(\text{CO})_6]$ (b) $[\text{V}(\text{CO})_6]$ (c) $[\text{Fe}(\text{CO})_5]$ (d) $[\text{Ni}(\text{CO})_4]$
- Sodium nitroprusside with sulphide give _____ colour.
(a) red rose (b) violet (c) green (d) blue

Q-2 Attempt any six

[12]

- Which d-block elements of 3d series show anomalous electronic configuration and give their correct electron configuration.
- Which transition metal complex ions are colourless? why?
- Give molecular formula of all the hydrate isomers of $\text{CrCl}_3 \cdot 6\text{H}_2\text{O}$ and give its physical properties.
- Define EAN of central metal ion in coordination compound and calculate EAN of Cr^{3+} ion in $[\text{Cr}(\text{NH}_3)_6]^{3+}$.
- Give general electronic configuration of Lanthanides and Actinides.
- Give the limitation of Lewis concept.
- Water is amphoteric solvent, explain.
- Classify the metallic carbonyls giving suitable examples.

(P.T.O.)

- Q-3** [04]
 (a) Discuss the variation in ionisation energies of d-block elements as we move across a particular series and from top to bottom in group IIIB. [04]
 (b) Classify d-block elements and discuss any two series. [04]

OR

- Q-3** [04]
 (a) Write the name, symbol, complete and valence shell electronic configuration of 2nd transition series elements. [04]
 (b) Discuss the variation in ionization energies of d-block elements as we moving across a period and form top to bottom in group IIIB. [04]

- Q-4** [04]
 (a) How will you determine the paramagnetic or diamagnetic nature of a given substance? [04]
 (b) Give the preparation, properties and structure of interstitial nitrides of transition metals. [04]

OR

- Q-4** [04]
 (a) Explain the purple colour of octahedral $[\text{Ti}(\text{H}_2\text{O})_6]^{3+}$ ion by d-d transition. [04]
 (b) Write a note on metallic carbides of transition metal. [04]

- Q-5** [04]
 (a) Explain the basic postulates of Werner's coordination theory. [04]
 (b) Justify, optical isomerism rarely occurs in square planar complexes. [04]

OR

- Q-5** [04]
 (a) Describe a chemical method to distinguish between cis and trans isomers of the complex $[\text{Pt}(\text{NH}_3)\text{Cl}_2]^0$. [04]
 (b) Write the structure of $\text{CoCl}_3.6\text{NH}_3$, $\text{CoCl}_3.5\text{NH}_3$, $\text{CoCl}_3.4\text{NH}_3$ and $\text{CoCl}_3.3\text{NH}_3$ according to Werner's theory. [04]

- Q-6** [04]
 (a) What are Lanthanides? Write their atomic numbers, symbols, names and electronic configurations. [04]
 (b) Discuss the various oxidation states of Actinides. [04]

OR

- Q-6** [04]
 (a) Give comparison between Lanthanides and Actinides. [04]
 (b) Give the brief account on consequences of Lanthanide contraction. [04]

- Q-7** [04]
 (a) Give brief account on Arrhenius acid-base concept with its utility and limitations. [04]
 (b) Discuss the advantages and disadvantages of using liquid NH_3 as solvent. [04]

OR

- Q-7** [04]
 (a) Explain Pearson's concept of hard and soft acid and base with suitable examples. [04]
 (b) Explain the term levelling effect in terms of aqueous and non-aqueous solvents. [04]

- Q-8** [08]
 Discuss the preparation, properties, structure and hybridization in $\text{Co}_2(\text{CO})_8$. [08]

OR

- Q-8** [08]
 Give the general chemical properties of metallic carbonyls. [08]