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B.Sc. 4th Semester (Hons.) (New Scheme)

Examination, May-2016

CHEMISTRY

Paper-CH(H)-206, P-23

Inorganic Chemistry

*Time allowed : 3 hours] [Maximum marks : 40*

*Note : Attempt five questions in all, selecting one question from each section. Question No. 1 is compulsory. All questions carry equal marks.*

1. (a) M-M bond is present in
- (i)  $[\text{Mo}(\text{CN})_7]^{2-}$
  - (ii)  $\text{WF}_8^{2-}$
  - (iii)  $\text{Mo}_2(\text{OR})_6$
- (b) Write the stable oxidation state of Au.
- (c) Giving reasons arrange the following in order of increasing acid strength  
HF, HCl, HBr, HI.
- (d) Write down the name of principle ores of silver.
- (e) Describe calcination and roasting.
- (f) Which lanthanide has the configuration  $4f^7 5d^1 6s^2$ ?
- (g) Which of the two  $\text{Ce}^{3+}$  or  $\text{Gd}^{3+}$  has smaller size?
- (h) Actinides have greater tendency to form complexes. Explain. 1×8=8

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**Section-A**

2. (a) Explain why complexes of first transition series are mainly high spin while those of 2nd and 3rd transition series are of low spin. 4
- (b) First I.E. of 5d element are higher than those of 3d and 4d elements. Give reasons. 4
3. (a) Why the stereochemistry of complexes of first transition series is quite different from that of 2nd and 3rd transition series? Give the type of geometries having co-ordination no. 7 and co-ordination number 8 of 2nd and 3rd series. 4
- (b) Briefly explain the chemistry of Mo in different Oxidation states. 4

**Section-B**

4. (a) Explain Lux-Flood theory of acids and bases. 4
- (b) Explain why  $\text{HCl}$  and  $\text{HClO}_4$  have equal strength in water. Explain that effect in detail. 4
5. (a) Give the aqueous Chemistry of Mo(VI). 4
- (b) Why 2-methyl pyridine is weaker than pyridine? 4

**Section-C**

6. (a) What is Bessimerisation? 3
- (b) Write short note on Electrolytic refining. 3
- (c) Write principle ores of Cu. 2

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7. (a) Give an account of metallurgy of zinc. 6
- (b) Write short note on roasting. 2

**Section-D**

8. (a) Discuss the following properties of Lanthanides :  
(i) Tendency to form complexes 4  
(ii) Oxidation states. 4
- (b) What are the problems in Separation of Lanthanides from one another? 4
9. (a) Give the chemistry of main principles of separation of U from Np, Pu and Am. 6
- (b) Ions of actinides are coloured. Discuss. 2

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