

S.Y.B.Sc. II (With Credits)-Regular-Semester 2012 Sem IV
B.Sc. 2451 - Chemistry – I : Paper - I (Inorganic Chemistry)

P. Pages : 2

Time : Three Hours



GUG/W/16/5598

Max. Marks : 50

1. a) What are lanthanides ? Discuss the electronic configuration and oxidation states of Lanthanides. 5
- b) Discuss actinides with respect to. 5
- i) Ionic radii ii) Oxidation state

OR

- c) Discuss lanthanides with respect to their complex formation tendency. 2½
- d) Discuss lanthanide contraction. 2½
- e) Discuss the position of actinides in periodic table. 2½
- f) Explain why- 2½
- i) Eu^{+2} is more stable than Ce^{+2} .
- ii) $\text{La}(\text{OH})_3$ is more basic than $\text{Lu}(\text{OH})_3$.
2. a) Discuss Werner's theory of Co-ordination compounds. How it can be verified experimentally. 5
- b) Discuss types of structural isomerism with one example of each. 5

OR

- c) Calculate effective atomic numbers of following complex. 2½
- i) $[\text{Ni}(\text{H}_2\text{O})_6]^{2+}$ (Z=28) ii) $[\text{Pd}(\text{NH}_3)_6]^{4+}$ (Z=46)
- d) What are chelates and write its two industrial applications. 2½
- e) Explain why $[\text{Fe}(\text{CN})_6]^{4-}$ is diamagnetic while $[\text{FeF}_6]^{4-}$ is paramagnetic in nature. 2½
- f) Distinguish between double salt and co-ordination compounds. 2½
3. a) What is gravimetric analysis ? Give various steps involved in estimation of Barium as barium sulphate gravimetrically. 5
- b) Explain Pearson's SHAB principle. Write its four applications. 5

OR

- c) Why ash treatment is necessary in gravimetric estimation of barium as barium sulphate ? 2½
- d) What are hard and soft acids and Bases ? Give one example of each. 2½
- e) Write note on atom economy from the point of view of green chemistry approach. 2½
- f) Discuss the significance of green chemistry. 2½
4. a) What are frost diagram ? Give their application with example. 5
- b) What is meant by "dressing" of the ore? Discuss various processes carried out for the dressing of the ore. 5

OR

- c) What is meant by smelting ? 2½
- d) Discuss the principle involved in extraction of element. 2½
- e) Discuss Pourbaix diagram of Mn. 2½
- f) Write note on calcination. 2½
5. Attempt **any ten**.
- i) Name any two ores of lanthanides. 1
- ii) Give electronic configuration of Cm (z = 96). 1
- iii) Why cerium (Ce) and Terbium (Tb) shows +4 stable oxidation state ? 1
- iv) Define co-ordination sphere. 1
- v) Name the following complex. 1
- a) $[\text{Cu}(\text{NH}_3)_4] \cdot \text{SO}_4$ b) $[\text{PtCl}_4(\text{NH}_3)_2]$.
- vi) What do you meant by inner orbital complex. 1
- vii) State any two conditions for precipitation in gravimetric analysis. 1
- viii) Define symbiosis. 1
- ix) Give any one industrial application of green chemistry. 1
- x) Define oxidation and reduction in term of electron transfer. 1
- xi) State Nernst equation. 1
- xii) What is electrometallurgy. 1
