Bachelor of Science (B.Sc. - II) Fourth Semester

B.Sc. 2451 - Chemistry : Paper-I (Inorganic Chemistry)

P. Pages : 2 **GUG/W/18/1284**

Time : Three Hours * 0 9 9 7 * Max. Marks : 50

Notes : 1. All questions are compulsory and carry equal marks.

1. a) What are Lanthanides? Explain following properties of Lanthanides? **5**
i) Electronic configuration.
ii) Oxidation state.

b) Discuss the properties of Actinides with respect to it's **5**
i) Oxidation state
ii) Atomic and ionic radii.

OR

c) Define Lanthanide contraction. What are the consequences of Lanthanide contraction? **2½**

d) Describe ion exchange method for separation of Lanthanides? **2½**

e) Discuss the position of Actinides in periodic table? **2½**

f) Discuss the Lanthanides with respect to their complex formation tendency. **2½**

2. a) Explain the formation of cobalt amine complexes on the basis of Werner's theory. **5**

b) What is geometrical isomerism? Explain geometrical isomerism shown by 6 coordinated complexes. **5**

OR

c) What are chelates? How are they classified. **2½**

d) Define EAN. Calculate EAN of the metal in following complexes. **2½**
i) $[CO(NH_3)_6]^{3+}$ ii) $[Cu(CN)_4]^{3-}$

e) Explain the hybridization of following complexions on the basis of VBT? **2½**
i) $[Cu(NH_3)_4]^{2+}$ ii) $[NiCl_4]^{2-}$

f) What is isomerism? Explain ionisation isomerism with example. **2½**

3. a) Explain the steps involved in gravimetric Analysis of Barium as Barium Sulphate. **5**

b) Give the significance of Green chemistry. Explain Atom Economy with suitable example. **5**

OR

c) Explain the terms. **2½**
i) Post Precipitation. ii) Co precipitation.

d) What is Pearson's SHAB principle? Discuss any two applications of SHAB principle? **2½**

e) Write a note on supercritical carbon dioxide on the basis of Green chemistry. **2½**

f) Differentiate between Hard acids and soft acids? **2½**

4. a) How will you Account for the disproportionation of hydrogen peroxide with the help of Latimer diagram? **5**

b) Explain the terms: **5**
i) Smelting ii) Roasting iii) Calcination.
What is the importance of ore dressing?

OR

c) Draw the froast diagram of Nitrogen in acidic solution. **2½**

d) Explain pourbaix diagram of iron species. **2½**

e) Explain the principle behind gravity separation. **2½**

f) Explain Froath floatation process. **2½**

5. i) What is inner transition elements. **1**

ii) Write any two name of ores of Lanthanides. **1**

iii) Give the General electronic configuration of Actinides. **1**

iv) What are ligands? **1**

v) Define co-ordination isomerism. **1**

vi) Write formula for pentammine nitrito (o) cobalt (III) chloride. **1**

vii) Define the term Gravimetric Analysis. **1**

viii) Give any two principles of Green chemistry. **1**

ix) What is symbiosis. **1**

x) Why refining of metal is necessary? **1**

xi) Define the term oxidation and Reduction? **1**

xii) What is slag? **1**

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