Code No: NR10801 **NR**

I B.Tech Supplementary Examinations, November/December 2005
INORGANIC & ANALYTICAL CHEMISTRY
(Chemical Engineering)

Time: 3 hours **Max Marks: 80**

Answer any FIVE Questions
All Questions carry equal marks

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1. (a) Discuss the Oxidation states of Chromium compounds?
   (b) What are the electronic structure of Zn, Cd, and Hg and of their wt ions? Discuss their position in the periodic table? [4+12]

2. (a) What are the main ores of Sn and Pb and how are these metals extracted?
   (b) What are the main uses of lead? [12+4]

3. (a) Why are multidentate ligands preferable to unidentate ligands for complexmetric titrations?
   (b) How does calculation of the electrode potential of the system at the equivalent point differ from that for any other point of Oxidation/reduction titration?
   (c) Why are the standard reagents used is neutralisation titrations generally strong acids and bases rather than weak acids and bases. [4+6+6]

4. (a) What causes chemical shifts in NMR spectroscopy?
   (b) Why do nuclei such as ^{12}C, ^{16}O which do not possess nuclear spin do not show NMR spectra?
   (c) How many fundamental vibrational frequencies would you expect to observe in the infrared absorption spectrum of CO_2? [6+6+4]

5. (a) Discuss on the principles underlying polarography and amperometric titration?
   (b) Give an account of important applications of Polarography. [10+6]

6. (a) Discuss how the separation of a mixture of metal ions is obtained by electrogravimetric method.
   (b) Explain the principles involved in potentiometric titrations? [8+8]

7. Discuss the application of ion-exchange in
   (a) Separation of Lanthanides
   (b) Softening of hard water
   (c) Removal of organic compounds extracted in water.
   (d) Removal of interfering radicals in quantitative analysis. [4+4+4+4]

8. Write short notes on:

(a) Electrode potential

(b) Ores of ω?

(c) Germanium compounds in semiconductors

(d) Masking agents. [4+4+4+4]

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