Roll No. .....

(05/16-I)

5212

B. Sc. EXAMINATION

(Fourth Semester)

CHEMISTRY

CH-204

Inorganic Chemistry

Time : Three Hours *Maximum Marks : 27*

Note : Attempt *Five* questions in all. Q. No. **1** is compulsory. Attempt *four* questions from Sections A and B selecting not more than *two* questions from each Section.

1. (a) Which lanthanide is radioactive in nature ?

   (b) What is lanthanide contraction ?

   (c) What do you understand by transuranic elements ?

   (d) Magnetic behaviour of actinides is difficult to predict. Why ?

   (e) Explain NH_4OH and not NaOH is used as group reagent in qualitative analysis of group-III.

   (f) Which basic radicals are present in group-III of inorganic analysis ?

   (g) What is the role of HCl in groupd test for group-II ? 1×7

Section A

2. (a) Discuss the magnetic behaviour of lanthanides in detail

   (b) Compare the basic behaviour of $La(OH)_3$ with that of $Lu(OH)_3$. 3+2

3. (a) Compare the properties of *d*-block elements with those of *f*-block elements with respect to :

   (i) Size

   (ii) Oxidation states

(iii) Basic character of oxides

(iv) Complex formation

(v) Magnetic behaviour

(vi) Spectral behaviour.

(b) Why chemistry of Actinides is more complex as compared to Lanthanides ? 3+2

4. (a) Discuss three methods of separation of mixture of various lanthanides into individual elements.

(b) Discuss the complex formation tendencies of actinides. 3+2

Section B

5. (a) What are interfering radicals ? How and at what stage do they interfere ? Discuss the chemistry of removal of oxalate ions from a mixture.

(b) How will you detect carbonate ions in presence of sulphite ions in a mixutre ? 3+2

6. (a) In basic group analysis, H_2S is used as a group reagent in two groups. In what way the two group tests are different ? Explain giving various principals involved.

(b) List important points of difference between co-precipitation and post-precipitation. 3+2

7. (a) What are the various possible gases which may release on adding dilute HCl to a mixture of salts ? Also write how these gases can be detected ?

(b) Discuss chemistry of chromyl chloride test. 3+2