Roll No. ..... Total Pages : 4

GSM/M-20 **1620**

CHEMISTRY

(INORGANIC CHEMISTRY)

Paper–XI-CH-204

Time Allowed : 3 Hours] [Maximum Marks : 32

Note : Attempt **five** questions in all, selecting at least **two** questions from each Unit. Question No. **1** is compulsory. Marks are indicated against each question.

Compulsory Question

1. (i) What are Misch Metals?

(ii) Write down the general electronic configuration of Actinides.

(iii) Which of the two is more basic : GD_2O_3 or Ybo.

(iv) Complete the following reaction :

$$Ln_2O_3 + 6NH_4Cl \xrightarrow{300°C} ?$$

(v) What is Nessler Reagent?

(vi) Name the acidic radicals which neither tested by dil.H_2SO_4 nor by concentrated H_2SO_4.

(vii) Which element is produced by β-decay of Neptunium?

(viii) Write down the name of two cations which give flame test. 1×8=8

UNIT–I

2. (a) Lanthanides do not form Oxocations. Why? 2

(b) How is Lanthanide contraction effects properties of second and third transition series? 2

(c) Draw and explain the structure of $Ce(NO_3)_4(Opph_3)_2$. 2

3. (a) Why do actinides show higher oxidation state than Lanthanides? 2

(b) Write the name and electronic configuration of element having atomic number 95. 2

(c) Why is it difficult to interpret the paramagnetic behaviour of actinides? 2

4. (a) What is the source of white light in gas mantles? 2

(b) Ions of actinides are coloured. Explain? 2

(c) What are transuranic elements? How is californium formed? 2

5. (a) Sketch the flow chart diagram for the reprocessing of nuclear fuel. 3

(b) Discuss in detail the ion-exchange method for the separation of lanthanides? 3

UNIT–II

6. (a) How does common ion effect operates in detection of group III cations? 2

(b) Calculate the solubility of $pbcl_2$ if its solubility product is 1.0×10^{-6} at 298k. 2

(c) Write down the cations of Group IV and V. 2

7. (a) Discuss the theory of the following tests :

(i) Lake test for Aluminium.

(ii) Ring test for Nitrate. 3

(b) What is the role of digestion in Precipitation? 3

8. (a) Explain Zirconyl methods for removing the interference of phosphate ions. 3

(b) What are the main differences between coprecipitation and post precipitation. 3

9. (a) How will you test for Borate? 2

(b) What happens when : 2

(i) Sodium iodide is heated with MnO_2 and conc. H_2SO_4.

(ii) Potassium ferrocyanide sol^n. is added to ferric chloride solution.

(c) What is salt effect? How does it affect the solubility of precipitates? 2.