

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 :
$$\text{Ln}_2\text{O}_3 + 6\text{NH}_4\text{Cl} \xrightarrow{300^\circ\text{C}} ?$$
- (v) What is Nessler Reagent?
- (vi) Name the acidic radicals which neither tested by $\text{dil.H}_2\text{SO}_4$ nor by concentrated H_2SO_4 .
- (vii) Which element is produced by β -decay of Neptunium?

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- (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 $\text{Ce}(\text{NO}_3)_4(\text{O}^-\text{pph}_3)_2$. 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 solⁿ. is added to ferric chloride solution.
- (c) What is salt effect? How does it affect the solubility of precipitates? 2.