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**FOURTH SEMESTER B.Sc. DEGREE EXAMINATION, APRIL/MAY 2005**

(Vocational Course)

Branch : Industrial Chemistry

Optional Subject - Chemistry

Paper IV—INORGANIC CHEMISTRY—II

(Old Scheme - Prior to 1999 Admission)

Time : Three Hours

Maximum : 130 Marks

**Section A**

*Answer any ten questions.  
Each question carries 4 marks.*

1. Suggest suitable indicators for the following titrations :
  - (a) Strong acid X weak base.
  - (b) Strong base X weak acid.
2. What do you mean by active hydrogen ?
3. With the help of the electronic configuration, how would you account for the different colours produced by alkali metals in bunsen flame ?
4. Why does beryllium differ so much from the rest of the alkaline earth metals ?
5. Write any two methods for the preparation of lithium aluminium hydride.
6. Give a very brief account of the structures of diamond and graphite.
7. How would you prepare hydrazoic acid ?
8. How would you identify As-Sb poison using Mirror test ?
9. Write a short note on the structure of SF<sub>6</sub>.
10. Give any two methods for the preparation of HOCl.
11. What do you mean by low spin complexes and high spin complexes ?
12. Discuss the electronic configuration of lanthanides.
13. Write a short note on crystal field splitting.
14. What do you mean by calcination ?
15. A primary standard solution of NaOH cannot be prepared. Why ?

(10 × 4 = 40 marks)

## Section B

Answer any five questions.

Each question carries 10 marks.

16. (a) Why should interfering anions be eliminated before the analysis of basic radicals ?  
(b) Discuss the principle involved in the Iodimetric –Iodometric titrations.
17. What are hydrides ? How are they classified ? Write the preparation and properties of complex hydrides.
18. Discuss the general trend in the Group I metals with respect to Atomic radii, ionization potential, and electronegativity.
19. Compare the properties of Beryllium and Aluminium.
20. Give any five properties of diborane.
21. Describe the separation of inert gases by charcoal adsorption method.
22. Give a comparative account of the following metals :-  
(a) Cu.      (b) Ag.      (c) Au.
23. Write the names of the following complexes :  
(a)  $[\text{Fe}(\text{H}_2\text{O})_6] \text{SO}_4$ .    (b)  $\text{K} [\text{P}_t(\text{NH}_3) \text{Cl}_5]$ .      (c)  $\text{K}_4 [\text{Fe}(\text{CN})_6]$ .  
(d)  $[\text{Co}(\text{NH}_3)_6] \text{Cl}_3$ .    (e)  $\text{Na}_3 [\text{Co}(\text{NO}_2)_6]$ .
24. Describe the ion exchange method for the separation of lanthanides.
25. How is Nickel extracted from its ore ?

(5 × 10 = 50 marks)

## Section C

Answer any two questions.

Each question carries 20 marks.

26. Discuss the preparation, properties and uses of steel.
27. (a) Discuss the preparation and properties of  $\text{SO}_2$ .  
(b) Discuss briefly interhalogen compound.
28. (a) Discuss the preparation, properties and uses of nitric oxide.  
(b) Discuss the preparation and properties of phosphine.
29. (a) Give at least three properties of ozone.  
(b) Write any four properties of boric acid.  
(c) Write any three properties of  $\text{N}_2\text{H}_4$ .

(6 + 8 + 6 = 20 marks)

(2 × 20 = 40 marks)