

2023
B.A./B.Sc.
Third Semester
 CORE – 5
CHEMISTRY
Course Code: CHC 3.11
 (Inorganic Chemistry - II)

Total Mark: 70
Time: 3 hours

Pass Mark: 28

Answer five questions, taking one from each unit.

1. (a) Explain purification of metals by oxidation and poling process. 3+3=6
 (b) Discuss purification of Cu by electrolytic reduction process. 4
 (c) Write short notes on the following: 2×2=4
 (i) Positive standard electrode potentials
 (ii) Negative standard electrode potentials

2. (a) What do you mean by Ellingham diagrams? Give the important applications and limitations of Ellingham diagrams. 1+4=5
 (b) Name two examples of each of the following: 1×3=3
 (i) Sulphide ores
 (ii) Oxide ores
 (iii) Carbonate ores
 (c) What is the difference between mineral and ore? 2
 (d) Explain the purification of metals by Park's process. 4

3. (a) What is conjugate acid-base pair? Explain with two suitable examples. 1+3=4
 (b) Explain Lux-flood concept of acids and bases. 4
 (c) Discuss Symbiosis with examples. 4
 (d) Define Bronsted and Lowry concept of acids and bases. 2

4. (a) Discuss solvent system concept of acids and bases. 4

- (b) Arrange the following in decreasing order of acidic strength: 3
- (i) HClO_3 , HClO_4 , HClO , HClO_2
- (ii) CH_4 , NH_3 , HF , H_2O
- (iii) H_3PO_2 , H_3PO_4 , H_3PO_3
- (c) Discuss the acidic strength of group - 16 hydrides. 3
- (d) Write a short note on amphoprotonic substances. 4
5. (a) Discuss the similarities of Al and Be with respect to diagonal relationship. 4
- (b) Give a detailed account of the complexes of alkali metals formed with polydentate ligands. 5
- (c) Name the group -15 elements and mention the oxidation states shown by the elements of the group. 3
- (d) Mention the allotropic forms of phosphorus. 2
- 6 (a) Name the group-16 elements. Discuss the relative stability of different oxidation states of group-16 elements. 2+3=5
- (b) Write short notes on ionic and covalent hydrides with examples. $2\frac{1}{2}+2\frac{1}{2}=5$
- (c) Explain wrap around complexes with examples. 4
7. (a) Give any one method of preparation of Diborane. Discuss its structure. 1+3=4
- (b) Write the chemical formula and draw the structure of phosphorous acid. 1+1=2
- (c) Give one method of preparation of Caro's acid. Discuss how it acts as powerful oxidizing agent. 2+2=4
- (d) Write any four chemical and physical properties of halogens. 4
8. (a) What is borax bread test? Discuss with examples. 1+2=3
- (b) Discuss with examples how HNO_2 can act both as oxidizing and reducing agent. 4
- (c) List any three oxo-acids of chlorine and draw their structures. 1+1+1=3
- (d) What are pseudo halides? Discuss with examples how it behaves as halides. 1+3=4

9. (a) Give the synthesis and applications of siloxanes. 3
(b) Write the preparations and structures of $(\text{NPCl}_2)_3$ and $(\text{NPCl}_2)_4$. 2+2=4
(c) Write any three uses of argon. 3
(d) Write short notes on the following: 2×2=4
(i) Heteroatomic inorganic polymers
(ii) Inorganic condensation polymers
10. (a) Explain the rationalization of inertness of noble gases. 3
(b) Give the preparation, type of hybridization and structure of XeF_2 and XeF_4 . 2+2=4
(c) How would you prepare the borazine? Explain its structure. 1+2=3
(d) Write short notes on the following: 2×2=4
(i) Silicates
(ii) Clathrates
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