

Subject Code—52607

B. Sc. EXAMINATION

(Batch 2018) (Main)

(Fifth Semester)

CHEMISTRY

CCL-503 (ii)

Paper—I

Chemistry of Main Group Elements, Theories
of Acids and Bases—I

Time : 3 Hours

Maximum Marks : 80

Note : Attempt *Five* questions in all. Attempt *Five* questions in all. Q. No. 1 is compulsory.

1. (a) ✓ Which of the following compounds is stronger Lewis acid and why ? 2

BF_3 and BCl_3 .

- (b) What are conjugate acids and bases ? 2

- (c) What do you understand by Blister copper ? 2
- (d) Give *two* applications of Ellingham diagram. 2
- (e) What is diagonal relationship ? 2
- (f) What are oxidation states of S-Block elements ? 2
- (g) What are Cryptates ? 2
- (h) What are ammoniated electron ? 2

Unit I

- 2. (a) What are Hard and Soft Acids ? Discuss their characteristic features. 8
- (b) Describe Lux-Flood concept of acids and Base with suitable examples. 8
- 3. (a) How does the solvent play an important role in determining the strength of Lewis Acids and Bases ? 8

- (b) In each pair of acids which is a stronger acid and why ? 6
- (i) CH_3COOH and CH_2ClCOOH
- (ii) HClO_2 and HClO_4
- (c) What is an acid, according to solvent system concept ? 2

Unit II

4. Explain the following techniques which are employed for the purification of a metal : 16
- (i) Zone Refining
- (ii) Mond's Process.
5. (a) Describe with diagram the Electrolytic method for getting pure zinc. 8
- (b) Explain the following terms : 4,4
- (i) Hydrometallurgy
- (ii) Parting process.

Unit III

6. (a) Explain the anomalous behaviour of Lithium. 6

- ✓ (b) Define Inert Pair Effect. Discuss by taking suitable example. 6
- (c) Why Be and Mg do not impart any characteristic flame colour ? 4
7. (a) Describe different allotropes of Phosphorous. 4
- (b) Compare the *s*-block elements with *p*-block elements with regard to the following properties : $4 \times 3 = 12$
- (i) Ionisation Energy
 - (ii) Electron gain Enthalpy
 - (iii) Reducing Nature.

Unit IV

8. (a) Explain, why lithium forms oxides, sodium forms peroxide and potassium forms superoxide ? 6
- (b) Explain thermal stability of carbonates and solubility of sulphates of alkaline earth metals. 10

9. (a) Discuss the structure of Salicylaldehyde with Na^+ ion. 6
- (b) Compare the complexing ability of alkali and alkaline earth metals. 6
- (c) Write short note on structure of Basic benzoate. 4