

UNIT V

13. (a) Define Packing efficiency of a molecule. (2)
(b) Diamond is hard while graphite is soft. why? (2)
14. (a) Describe the rutile structure. (6)

Or

- (b) Explain free electron theory of metallic bonding. (6)
15. (a) Explain the Work of Laue and Bragg on X-ray diffraction studies of crystals. (10)

Or

- (b) What do you mean by lattice defects in ionic crystals? Explain Schottky defect and Frenkel defects in ionic solids. (10)

5551/MC1

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Paper I — INORGANIC CHEMISTRY — I

Time : Three hours

Maximum : 100 marks

UNIT I

1. (a) What are the factors which affect the geometry of a molecule. (2)
(b) Explain the hybridisation involved in PCl_5 and SF_6 . (2)
2. (a) Give an account of Born-haber cycle with example. (6)

Or

- (b) Explain the bonding in simple triatomic molecule with example. (6)
3. (a) Write short notes on :
(i) Born-lande equation. (5)
(ii) Energetics of dissolution of ionic compounds. (5)

Or

- (b) Draw and explain the M.O. level diagram of a hetero nuclear diatomic molecule. (10)

UNIT II

4. (a) Mention the uses of lanthanides. (2)
(b) Contraction in actinides is not so pronounced as in lanthanides. Why? (2)
5. (a) Differentiate lanthanides from the transition elements. (6)

Or

- (b) Compare ferromagnetism and antiferromagnetism. (6)
6. (a) What is separation factor? Discuss the modern methods of separation of lanthanides. (10)

Or

- (b) Explain the origin of para and diamagnetism. Discuss the Gouy method of determination of magnetic susceptibility. (10)

UNIT III

7. (a) HNO_3 behaves as a base in liq. HF. why? (2)
(b) State HSAB principle. (2)
8. (a) Write a short note on Symbiosis. (6)

Or

- (b) Outline the theory behind hard-hard and soft-soft interaction. (6)

9. (a) How solvents are classified? Give examples for each type. (10)

Or

- (b) Give a detail account of molten salts as non aqueous solvents. (10)

UNIT IV

10. (a) Distinguish between odd and even parity. (2)
(b) How can the fertile isotope be used for fission? (2)
11. (a) Outline the application of radioactive isotopes in the medical field. (6)

Or

- (b) Discuss the meson theory of binding forces of nuclear. (6)
12. (a) Give the salient features, application and limitation of liquid drop model. (10)

Or

- (b) Discuss the FBTR at Kalpakkam. Write a note on stellar energy. (10)