



PART B — (5 × 16 = 80 marks)

11. (a) State and prove the Wiedemann — Franz law. (16)

Or

- (b) Explain the superconducting phenomena. What are its properties? Distinguish between Type-I and Type-II Superconductors. (16)

12. (a) Derive an expression for carrier concentration in an intrinsic semiconductor. (16)

Or

- (b) What is Hall Effect? Derive an expression for Hall coefficient. (16)

13. (a) (i) Distinguish between hard and soft magnetic materials. (8)

- (ii) Give an account of structure, properties and application of ferrites. (8)

Or

- (b) What is meant by local field in a dielectric and how is it calculated for a cubic structure? Deduce Clausius-Mosotti equation. (16)

14. (a) What are metallic glasses? Explain their properties and applications. (16)

Or

- (b) Explain the characteristics and applications of ceramics. (16)

15. (a) Describe any two medical applications of ultrasonics. (16)

Or

- (b) Describe the principle and working of Geiger — Muller counter. (16)