

Chapter	Contents	Page No
I	Conducting Materials	1
	1.1. Introduction	1
	1.2. Conducting Materials	2
	1.3. Electron Theory of Solids	3
	1.4. Classical Free Electron Theory	4
	1.5. Quantum Theory	11
	1.6. Fermi Dirac Distribution Function	12
	1.7. Density of States	14
II	Semiconducting Materials	18
	2.1. Introduction	18
	2.2. Types of Semiconductors	19
	2.3. Hall Effect	29
III	Magnetic Materials and Superconducting Materials	34
	3.1. Introduction	34
	3.2. Basic Terms and Definitions	34
	3.3. Different Types of Magnetic Materials	37
	3.4. Super Conducting Materials	50
IV	Dielectric Materials	63
	4.1. Introduction	63
	4.2. Various Polarization Mechanisms Involved in Dielectric	65
	4.3. Active and Passive Dielectrics	71
	4.4. Frequency and Temperature on Polarisation of Dielectrics	72
	4.5. Internal Field or Local Field	73
	4.6. Dielectric Breakdown	78
	4.7. Applications of Dielectric Materials	81
	4.8. Ferro-Electricity and Applications	82

V	Advanced Engineering Materials	84
	5.1. Introduction	84
	5.2. Metallic Glasses	84
	5.3. Shape Memory Alloys	88
	5.4. Nanotechnology	93
	5.5. Non-Linear Materials and Bio-Materials	101
	Question Bank–PART A Questions and Answers	107
	PART–B Questions	129