

12.	a	i.	Obtain the expression for Fermi level in an intrinsic semiconductor and also explain the variation of Fermi level with temperature.	10	K2
		ii.	Explain band gap determination of a semiconductor.	6	K2
OR					
	b	i.	Derive the expressions for carrier concentration and Fermi energy in an N-Type Semi conductor.	12	K2
		ii.	Show the variation of Fermi level with temperature and impurity concentration of N-Type Semi conductor.	4	K3
13.	a	i.	Explain the classification of magnetic materials with their properties in detail.	8	K4
		ii.	What are soft and hard magnetic materials? Distinguish between soft and hard magnetic materials.	8	K4
OR					
	b	i.	Explain the various properties of super conducting materials.	10	K2
		ii.	Discuss type-I and type-II super conductors in details.	6	K2
14.	a	i.	Explain electronic, ionic, orientational and space charge polarization in detail.	10	K4
		ii.	Discuss in detail frequency and temperature dependence of polarization.	6	K4
OR					
	b	i.	Derive an expression for internal field in a dielectric material.	12	K2
		ii.	Deduce Clausius - Mosotti relation.	4	K3
15.	a	i.	What are metallic glasses? State their types.	4	K2
		ii.	Discuss the preparation, properties and applications of metallic glasses.	12	K2
OR					
	b	i.	Explain pulsed laser deposition and chemical vapour deposition methods for the preparation of nanomaterials.	10	K2
		ii.	Explain birefringence and also explain Kerr optical effect.	6	K2
