Enroll. No. _____

SILVER OAK COLLEGE OF ENGINEERING & TECHNOLOGY

ADITYA SILVER OAK INSTITUTE OF TECHNOLOGY

BE - SEMESTER–II • MID SEMESTER-I EXAMINATION – SUMMER 2019

SUBJECT: PHYSICS (3110018) (CE/IT/EC)

DATE: 13-03-2019 TIME: 12:00 Noon to 01:30 pm TOTAL MARKS: 40

Instructions: 1.Q. 1 is compulsory.
2. Figures to the right indicate full marks.
3. Assume suitable data if required.

Q.1	(a)	The critical temperature of Nb is 9.15 K. At zero Kelvin, the critical field is 0.196 T. Calculate the critical field at 6 K.	[03]
	(b)	Prove that superconductors are perfect Diamagnetic materials.	[03]
	(c)	Explain direct and indirect band gap with E-k diagrams.	[04]
Q.2	(a)	Explain density of states. Derive an expression for Density of states for conduction electron for unit volume of metal	[06]
	(b)	Explain BCS theory of superconductivity.	[05]
	(c)	The Critical temperature of a metal with isotopic mass 199.5 is 4.185K. Calculate the isotopic mass if critical temperature falls to 4.133K.	[04]
		OR	
Q.2	(a)	Explain different properties of superconductor in detail.	[06]
	(b)	Give assumptions, success and drawback of classical free electron theory.	[05]
	(c)	Explain Penetration depth in superconductivity.	[04]
Q.3	(a)	Explain classification of material as conductor, semiconductor and insulator.	[06]
	(b)	What are different applications of superconductors?	[05]
	(c)	What is Fermi function? Discuss variation of Fermi function with temperature.	[04]
		OR	
Q.3	(a)	Explain Kronig Penny model in detail and origin of band gap.	[06]
	(b)	Write a short note on effective mass and Phonons.	[05]
	(c)	Calculate the energy gap of Si given that it is transparent to radiation of wavelength greater than 11000 A^0.	[04]