Reg.No. _____

Karunya UNIVERSITY

(Karunya Institute of Technology & Sciences)
(Declared as Deemed-to-be University under Sec.3 of the UGC Act, 1956)

End Semester Examination – Nov/Dec – 2016

Code : 15PH3014 **Semester : 2016-17 ODD**
Sub. Name : Solid State Physics **Duration : 3hrs**
Max. marks : 100

ANSWER ALL QUESTIONS (5 x 20 = 100 Marks)

Q. No.	Sub Div.	Questions	Course Outcome	Marks
1.	a.	Write a short note on phonon momentum.	CO1	**04**
	b.	Briefly explain classical free electron theory. Explain nearly free electron theory in detail with its energy curve diagram	CO1	**16**
		(OR)		
2.	a.	Describe the concept of phonons and its modes in detail. Discuss various solid state properties of phonons in solid state phenomena.	CO1	**20**
3.	a.	With suitable diagram explain grain boundary in solids.	CO1	**04**
	b.	Explain band theory of solids in detail with necessary diagram.	CO1	**16**
		(OR)		
4.	a.	Derive the Bloch theorem based on band theory of solids.	CO1	**20**
5.	a.	What is polarisaiton in solids? Describe different types of polarisation in detail.	CO1	**08**
	b.	Find the expression relating the macroscopic dielectric constant with microscopic polarizabilities by driving the Classius-Mosotti relation.	CO1	**12**
		(OR)		
6.	a.	Give an account on antiferromagnetism and Neel temperature	CO1	**08**
	b.	Derive the equation for the temperature dependence of dielectric constant in a ferroelectric crystal with necessary graph.	CO1	**12**
7.	a.	Briefly describe trap capture and recombination centres in photo conductivity.	CO1	**08**
	b.	Explain Electro-luminescence in detail with an example and adequate graph	CO1	**12**
		(OR)		
8.	a.	Explain the microscopic origin of superconductors based on BCS theory of superconductivity in detail with adequate diagram.	CO1	**20**
		Compulsory:		
9.	a.	Describe high Tc superconductors with an example.	CO1	**06**
	b.	Explain Meissner effect in detail. How will you classify different types of superconductors? With appropriate graph explain it in detail.	CO1	**14**

ALL THE BEST