



LOYOLA COLLEGE (AUTONOMOUS), CHENNAI – 600 034

M.Sc. DEGREE EXAMINATION – PHYSICS

FOURTH SEMESTER – APRIL 2014

PH 4806 - SOLID STATE PHYSICS - II

Date : 27/03/2014

Dept. No.

Max. : 100 Marks

Time : 01:00-04:00

PART A

Answer **ALL** the questions

(10 × 2 = 20)

1. Distinguish between an intrinsic and extrinsic semiconductor.
2. How is Hall effect different in semiconductor as compared to metals?
3. What are polar and non-polar molecules? Give examples.
4. What is ferrrielectricity?
5. State any two laws of photo electric effect.
6. What are the various types of optical absorption processes?
7. Classify materials according to susceptibility.
8. What are domains? How are they useful?
9. What is Meissner effect?
10. What are characteristics of High T_c ?

PART – B

Answer any **FOUR** questions

(4 × 7.5 = 30)

11. Derive an expression for carrier concentration in an intrinsic semiconductor.
12. Discuss the classical theory of electronic polarisation.
13. Write a short note on photo conductive mechanism.
14. Discuss the classical theory of paramagnetism.
15. Derive an expression for London penetration depth.

PART – C

Answer any **FOUR** questions

(4 × 12.5 = 50)

16. Explain the rectifying and ohmic contact at a metal semi conductor contact.
17. Derive Curie law for a ferroelectric material.
18. Give the principle, construction and working of a MASER.
19. Derive an expression for the susceptibility of a dia-magnetic material.
20. What is flux quantisation? Explain with necessary theory AC and DC Josephson effect.
