

**LOYOLA COLLEGE (AUTONOMOUS), CHENNAI – 600 034**



**B.Sc. DEGREE EXAMINATION – PHYSICS**

**FIFTH SEMESTER – APRIL 2013**

**PH 5405 - MATERIAL SCIENCE**

Date : 08/05/2013  
Time : 1:00 - 4:00

Dept. No.

Max. : 100 Marks

**PART A**

Answer **ALL** questions

10 x 2 = 20

1. Define bond energy and bond length.
2. How do inert gases form van der Waal's bond?
3. What is meant by a symmetry operation?
4. What is a vacancy?
5. What are elastomers?
6. Distinguish between true strain and engineering strain.
7. Distinguish between hard and soft magnetic materials.
8. Define resolving power of a microscope.
9. Define Curie temperature.
10. What is meant by coercive field in magnetism?

**PART B**

Answer any **FOUR** questions

4 x 7.5 = 30

11. Describe the various levels of observation of structure with the tools used at different levels.
12. Write a note on point imperfections.
13. Explain how bond strength determines the elastic behaviour of materials?
14. Write a note on TEM with schematic diagram.
15. Discuss the intrinsic, thermal and defects types of breakdown in dielectrics.

**PART C**

Answer any **FOUR** questions

4 x 12.5 = 50

16. How are chemical bonds classified? Discuss characteristics and formation of ionic, covalent and metallic bonds.
17. What are lattice defects? Obtain expression for concentration of Schottky defects in ionic crystals.
18. Compare elastic behaviour of rubber with that of other materials. Obtain the expression for rubbery state by thermodynamic considerations.
19. Discuss the working of powder X – ray diffractometer with necessary diagram along with the experimental procedure to determine crystal structure.
20. What is hysteresis? What is the importance of B-H curve? How are materials classified according to hysteresis?

