



LOYOLA COLLEGE (AUTONOMOUS), CHENNAI – 600 034

B.Sc. DEGREE EXAMINATION – PHYSICS

FIFTH SEMESTER – NOVEMBER 2011

PH 5405 - MATERIAL SCIENCE

Date : 10-11-2011
Time : 9:00 - 12:00

Dept. No.

Max. : 100 Marks

PART – A

Answer **ALL** the questions

(10 X 2 = 20)

1. Give few examples for organic polymers.
2. Define bond length.
3. State Bragg's law of X-ray diffraction.
4. Draw the planes corresponding to the Miller indices (100) & (010).
5. Differentiate between slip and twinning of plastic deformation.
6. Define shear modulus.
7. Outline the principle of Radiographic method.
8. What are the advantages of Ultrasonic testing?
9. Differentiate between hard magnetic material and soft magnetic material.
10. What are domains?

PART – B

Answer any **FOUR** questions

(4 X 7.5 =30)

11. Discuss how the physical properties of materials are influenced by the variation in bonding character.
12. What is meant by symmetry operation? Explain the symmetry elements of a crystalline solid.
13. Briefly explain the role of elastic modulus as an important parameter in design.
14. Explain the hysteresis curve for a ferromagnetic material.
15. Explain the working of a metallurgical microscope with a neat diagram.

PART – C

Answer any **FOUR** questions

(4 X 12.5 =50)

16. Discuss the formation of ionic bond in sodium chloride crystal and hence obtain the expression for the potential energy of the system.
17. With necessary theory, explain the powder method of X-diffraction.
18. With the help of interatomic force vs. distance curve, explain the atomic model of elastic behaviour.
19. Explain the working of a scanning electron microscopic with a neat diagram.
20. Discuss the different types of polarization in a dielectric and derive an expression for the total polarization of a material.

