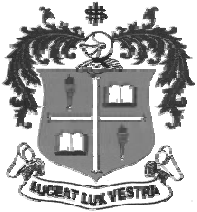


**LOYOLA COLLEGE (AUTONOMOUS), CHENNAI – 600 034**



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

**FIFTH SEMESTER – NOVEMBER 2013**

**PH 5405/5402 - MATERIAL SCIENCE**

Date : 14/11/2013  
Time : 9:00 - 12:00

Dept. No.

Max. : 100 Marks

**PART - A**

Answer **ALL** questions

(10 x 2 = 20)

1. Define the term bond energy
2. State the basic difference between semiconductor and a ceramic material
3. Define the term space lattice
4. What is a unit cell?
5. Define the term Poisson's ratio
6. Give the units of stress and strain
7. Define the term resolving power
8. Calculate the wavelength associated with a ultrasonic wave at a frequency of 20000 Hz.
9. What is dielectric breakdown?
10. What is space charge polarization?

**PART - B**

Answer any **FOUR** questions

(4 x 7.5 = 30)

11. Write a note on levels of structure.
12. Give the lattice specifications of 7 crystal systems.
13. Outline the concept of rubber like elasticity and explain how this concept is used in design of materials.
14. Obtain an expression for Half value thickness of a specimen.
15. Explain the concept of permanent magnetic moments.

**PART - C**

Answer any **FOUR** questions

(4 x 12.5 = 50)

16. Discuss in detail the classification of engineering materials according to their nature.
17. Explain how the powder method is used to determine the structure.
18. With reference to tensile stress-strain curve, explain the elastic properties.
19. Explain in detail electrical and ultrasonic method of characterising the surfaces by non-destructive testing.
20. Identify the various polarization mechanisms available and discuss the effect of frequency on dielectric constant.