



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

**M.Sc. DEGREE EXAMINATION - CHEMISTRY**

**THIRD SEMESTER – NOVEMBER 2013**

**CH 3875 - MATERIAL SCIENCE**

Date : 15/11/2013

Dept. No.

Max. : 100 Marks

Time : 9:00 - 12:00

**Part-A**

*Answer all questions. Each question carries two marks.*

1. Explain the phenomenon of “work hardening”.
2. Outline the super plastic behaviour of materials.
3. Mention the essential features of a unit cell.
4. What is meant by coherent and diffuse scattering?
5. Mention different types of gel.
6. Define Cooper pair of electrons.
7. Mention the differences between para and ferromagnets.
8. What are intrinsic semiconductors?
9. State Meissner effect.
10. Define pyroelectricity.

**Part-B**

*Answer eight questions. Each question carries five marks.*

11. Using the tensile stress-strain curve, explain the plastic deformation of materials.
12. With block diagram, outline the instrumentation, working and application of a TEM.
13. With the Czochralski geometry, outline the procedure for growing crystals by pulling mechanism.
14. Draw the Manson jar apparatus and explain the procedure for growing crystals by low temperature method.
15. Explain the concept and construction of reciprocal lattices.
16. Outline the proper and improper operations with suitable illustrations.
17. Define piezoelectricity. Explain any three applications.
18. What are Schottky defects? Explain with an example.

19. Mention any five differences between hard and soft magnets.
20. Draw the crystal structure of 1,2,3-oxide and explain.
21. Write a short note on the cheveral phases.
22. What are SMA? Explain the characteristics of SMA.

**Part-C**

*Answer four questions. Each question carries ten marks.*

23. Discuss the experimental procedure for determining hardness by Vickers method.
24. Discuss the principle of neutron diffraction and the experimental procedure.
25. With necessary diagram, state and explain the conditions for forming 3D lattices.
26. Draw B vs. H loop for ferromagnets and explain.
27. Write a short note on the reading, recording and storage of data using the magnetic parameters.
28. How is Honda cell helpful for the photosplitting of water? Discuss.

\*\*\*\*\*