



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

**B.Sc. DEGREE EXAMINATION – CHEMISTRY**

**SIXTH SEMESTER – NOVEMBER 2016**

**CH 6614 – CHEMISTRY OF MATERIALS**

Date: 16-11-2016  
Time: 09:00-12:00

Dept. No.

Max. : 100 Marks

**PART -A**

**Answer ALL the questions**

**(10 x 2 =20 marks)**

1. Define Neel temperature.
2. Draw the unit cell of CsCl.
3. What is SEM? Mention its Applications.
4. Distinguish between TGA &DTA.
5. What are piezoelectric materials?
6. What are liquid crystals? Give any two uses.
7. Explain Bragg's equation.
8. Give two examples for super conducting oxides.
9. Comment on the magnetic property of  $[\text{Fe}(\text{CN})_6]^{-3}$ .
10. What is Meissner effect?

**PART –B**

**Answer any EIGHT questions**

**(8 x 5 = 40 marks)**

11. Explain the Limiting radius ratio rules? How is it used to determine the coordination no. and geometry of a crystal?
12. What is SEM analysis? How is it used to study the surface morphology of the given composite?
13. Discuss the structure of Zinc Blende.
14. Distinguish between spinel and inverse spinel structure with a suitable example.
15. Describe the sol gel and hydrothermal method of preparation of materials.
16. Explain Bravais Lattice with suitable examples.
17. Explain the following (i) ferromagnetic (ii) antiferromagnetic materials.
18. What are organic semiconductors?
19. Explain the variation of conductivity with respect to temperature.
20. Write a note on solar energy conversion.
21. What are high energy batteries? Give their advantages over the other batteries.
22. How will you determine the magnetic susceptibility of a substance determined by Guoy method.

**PART – C**

**Answer any FOUR questions**

**(4 x 10=40 marks)**

23. Discuss the XRD method of single crystal analysis.
24. Discuss the stoichiometric and nonstoichiometric defects in crystals.
- 25 Write briefly on the following:
  - a) Permanent and temporary magnets
  - b) photoluminescence.
26. a) Give the principle, applications and working of TGA.
  - b) Explain the working of lithium battery.
27. a) Discuss Bardeen Cooper and Schuffer theory of superconductivity.
  - b) What are photovoltaic cells?
28. a) Give the principle of i. Zone refining ii. CVD.
  - b) Explain n and p type semiconductors with a suitable example.

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