LOYOLA COLLEGE (AUTONOMOUS), CHENNAI – 600 034

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

SIXTH SEMESTER – **APRIL 2018**

CH 6614– CHEMISTRY OF MATERIALS

Date: 21-04-2018 Dept. No. Max. : 100 Marks

Time: 09:00-12:00

PART-A

Answer **ALL** Questions **(10x2=20 marks)**

1. Define the term 'Bravais lattice'.
2. Draw the structure of Wurzite.
3. Mention any two applications of SEM.
4. Write the essential differences between TGA and DTA.
5. What are point defects?
6. What are photo galvanic cells? Give an example.
7. Define the term magnetic susceptibility.
8. What is Curie temperature?
9. Define the term superconductivity.
10. What is Meissner effect?

PART-B

Answer any **EIGHT** questions **(8x5=40marks)**

11. Calculate the edge length of the unit cell of a substance that crystallizes in the fccpattern. The density of the substance is 1.980g/cm^3 and its molecular weight is 74.5.
12. a) List out the differences between amorphous and crystalline substances

    b) Define the term Unit cell.
13. Write a note on radius ratio rules.
14. Explain the basic principle and procedure involved in Stockbarger method.
15. Calculate the mole fractions of Schottky and Frenkel defects in a NaCl crystal at 1000K. Given the energies of formation of these defects are 2eV and 3 eV respectively (1eV =1.602X10^{-19}J; K =1.38 x 10^{23} JK^{-1}).

16. Classify the given examples into metal excess defects or metal deficiency defects which are generally found in them?

    (i) NaCl (ii) FeO (iii) FeS (iv) NiO (v) KCl

17. Write a note on solar energy conversion.

18. Explain the variation of conductivity with respect to temperature.

19. How will you determine the magnetic susceptibility of a substance using Guoy method?

20. Explain the terms critical field strength and Silsbee effect with reference to super conducting materials.

21. What are high energy batteries? Give their advantages over other batteries.

22. a)What are super conducting materials? Give any two examples.

    b) Give any two applications of super conducting materials.

PART-C

Answer any **FOUR** questions **(4x10=40marks)**

23. Explain how X-rays are useful in the determination of structure of KCl?

24. a) Draw and explain the structure of rock salt.

    b) Write a note on photoluminescence.

25. Explain the basic principle, working procedure and the applications of the TGA.

26. Write notes on intrinsic and extrinsic semi conduction.

27. What are magnetic properties? Explain their classification with suitable examples.

28. Write short notes on the following:

    a) Cooper pairs b) Chevrel phase.

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