

M. Sc. DEGREE EXAMINATIONS – MARCH 2016
IV SEMESTER
Material Science & Nano Technology
PAPER II – PROPERTIES OF MATERIALS - II

45132

Time : 3 Hours

Max. Marks: 75

(No additional sheet will be supplied)

PART –A (5x3 = 15 marks)

Answer any FIVE questions.

Each question carries 3 marks.

Each answer should not exceed 1 page

1. Explain opacity and translucency in insulator
2. Explain size quantization effects in nanomaterials
3. State and explain Meissner effect
4. Write a note on first order and second order transitions in superconductors
5. Write a note on Kirkendal effect
6. Explain diffusion mechanism in solids
7. Write a note on electronic conduction
8. Explain the effect of microstructure on the electrical properties

PART –B (4x15 = 60 marks)

Answer ALL questions.

Each question carries 15 marks.

Each answer should not exceed 6 pages

9. What is Luminescence and explain various types of Luminescence. How do you experimentally determine the photoconductivity?
(OR)
10. Discuss the optical properties nanomaterials and explain surface Plasmon resonance.
11. Derive the Londons equations and calculate the penetration depth.
(OR)
12. Briefly explain BCS theory of superconductivity and mention the applications of superconductivity.
13. What is diffusion? Explain its importance and derive Fick's laws of diffusion.
(OR)
14. What is ionic conductivity? Explain the experimental determination of ionic conductivity.
15. Discuss the effect of temperature on conductivity of semiconductor and explain various methods to determine the electrical conductivity.
(OR)
16. Discuss the effect of particle size on electrical properties.

