Code No. 3493

FACULTY OF ENGINEERING

B.E. II – Semester (Main) Examination, June 2017

Subject: Engineering Physics – II

Time: 3 Hours **Max.Marks: 70**

Note: Answer all questions from Part A and any five questions from Part B.

PART – A (20 Marks)

1 Calculate the inter planar spacing for (3 2 1) plane in a simple cubic lattice. Where lattice constant is 4.2×10^{-10}m.

2 Define the term Fermi level and Fermi energy.

3 Distinguish between soft and hard magnetic materials

4 The superconducting transition temperature of a metal is 7.26K. The critical field at 0 K is 64×10^{3} A/m. Calculate the critical field at 5K.

5 Explain the concept of hole in semiconductor

6 Outline the effect of temperature on dielectric polarization

7 Mention the applications of electron microscopy

8 Write the properties of thin films?

9 What is quantum confinement?

10 Write a short note on carbon nano tubes.

PART – B (5x10 = 50 Marks)

11 a) Derive an expression for the concentration of Frenkel defect in an ionic crystal. (5)

b) Mention the salient features of band theory of solids on the basis of Kronig- Penny model. (5)

12 a) Mention general properties of super conductors? (5)

b) Describe Weiss molecular field theory of ferro magnetism. (5)

13 a) Explain different types of polarization mechanism in dielectrics. (5)

b) Deduce an expression for carrier concentration in intrinsic semiconductors. (5)

14 a) Sketch the block diagram of Atomic force microscope and explain its working principle. (5)

b) What is a thin film? Explain the thermal evaporation method for preparation of thin film. (5)

15 a) Describe different techniques to prepare nano phase materials. Explain the bottom-up approach. (5)

b) Write a note on electrical and magnetic properties of nano materials. (5)

16 a) What are miller indices? Sketch the miller indices for (1 1 0) (1 2 1) and (0 1 0) planes. (5)

b) What is Hysteresis? Draw a hysteresis loop for ferro magnetic material and explain the various important points on it. (5)

17 a) What is Hall Effect? Derive an expression for Hall coefficient, mobility and carrier concentration. (5)

b) Explain the Electron Beam Evaporation method of depositing thin films. (5)

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