CODE No. 16

FACULTY OF ENGINEERING

BE II Semester (Main & Backlog) Examination May/June 2018

Subject : Engineering Physics-II

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

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

PART-A (20 Marks)

1 Find the Miller indices of a set of parallel lines which make equal intercepts along the three Axes.
2 Write short note on crystal imperfections.
3 Write any four assumptions of free electron theory.
4 The intrinsic carrier density is $1.5x10^{16}/m^{-3}$ if the electron and hole motilities are 0.13 and $0.05m^2\ V^{-1}s^{-1}$ calculate the electrical conductivity.
5 What is Meissner effect in superconductors.
6 Mention the applications of Ferro electric material.
7 What is the significance of Hall effect.
8 Distinguish between a dielectric material and an insulator.
9 What are the advantages of thin films over bulk materials.
10 What is the surface to volume ratio at nano-scale.

PART-B (5x10=50 Marks)

11. a) Discuss the determination of lattice constants by powder diffraction method. 6
    b) Distinguish between insulator, semiconductor and conductors based on the energy band diagram. 4

12. a) Explain the hysteresis curve of a ferro magnetic materials on the basis of magnetic domains. 5
    b) State the Joshepson effect. Explain the properties of superconducting materials. 5

13. a) What is Hall effect? Obtain the expression for Hall coefficient. 5
    b) Explain the crystal structure of the Barium Titanate. 5

14. a) Explain the principle and the technique of X-ray fluorescence. 5
    b) Describe any one type of thermal evaporation technique with neat diagram. 5

15. a) Explain the synthesis of nano particles using Sol Gel method. 6
    b) Write the applications of nano particles. 4

16. a) Explain the frequency and temperature dependence of dielectric polarization. 6
    b) What are the salient feature of kronig-Penny model? 4

17. a) Obtain an expression for the conductivity of an n-type semiconductor. 5
    b) Explain construction and working of Scanning Electron Microscope(SEM). 5

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