Code No: 11378

FACULTY OF ENGINEERING

B.E. II – Semester (CBCS) (Supple.) Examination, Nov./Dec. 2018

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 (10x2 = 20 Marks)

1) Calculate the longest wavelength that can be analyzed by rock – salt crystal of spacing 2.5 $\overset{0}{A}$ in the first order.

2) Define space lattice. How it is helpful to describe a crystal structure.

3) What are ferrites?

4) Define critical transition temperature and critical field for superconductors.

5) Calculate the Hall coefficient of a specimen whose electrical conductivity is 2.12 ohm/m and charge carrier mobility is 0.3 m^2/v.sec

6) Discuss the important applications of ferro electric materials.

7) Distinguish between bulk, thin films and nano materials.

8) What are the applications of AFM?

9) Discuss the effect of surface to volume ratio in nano materials.

10) Mention the optical and magnetic properties of nano materials.

PART – B (50 Marks)

11. a) Distinguish solid materials based on band theory of solids   4
    b) Discuss the seven crystal systems in terms of lattice parametric consideration and type of Bravais lattice.   6

12. a) What are magnetic domains? Explain the Hysteresis loop of ferromagnetic material.   5
    b) Write a note on high temperature superconductors and their applications.   5

13. a) How the P-N junction is formed? Explain V-I characteristic graph of forward and reverse bias phenomenon in PN junction diode.   5
    b) How do you determine the dielectric constant by capacitance bridge method? 5

14. a) Explain the principle and applications of X-ray Fluorescence.   5
    b) Explain in detail about thermal evaporation technique to prepare thin films? 5

15. a) What are nano materials? Why do they exhibit different properties?   5
    b) Discuss the ball milling synthesis of nano materials.   5

16. a) Discuss the free electron theory of metals.   5
    b) Write a note on Type-I and Type-II superconductors? Explain their importance. 5

17. a) Explain the phenomenon of ferro electricity and discuss how dielectric constant of Barium Titanate changes with temperature.   5
    b) Describe the working of a thin film solar cell.   5

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