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MLR 15

Code No: A10004

MLR INSTITUTE OF TECHNOLOGY

(An Autonomous Institution)

I B.Tech II Semester advanced supplementary/improvement Examinations- July-2016

ENGINEERING PHYSICS

(ECE, MECH)

Time: 3 hours Max. Marks: 75

Note: 1. This question paper contains two parts A and B

2. Part A is compulsory which carries 25 marks .Answer all Questions in part A.
3. Part B consists of 5 units. Answer any one full question from each unit. Each question carriers 10 Marks and may have a, b,c sub questions.

PART –A (25 marks)

1. a) Write any two properties of the Matter waves 2M
   b) What is Hall Effect? 2M
   c) Define Intensity of Magnetisation and write its units 2M
   d) What is population inversion condition? 2M
   e) Write any two applications of smart materials 2M

2. a) What is a space lattice and Bravais lattice? 3M
   b) What are Maxwell-Boltzmann, Bose-Einstein and Fermi-Dirac statistics? 3M
   c) What is Piezo-electricity and Ferro electricity? 3M
   d)What is the basic principle of Optical fibre? 3M
   e) Write any three applications of Nano materials 3M

PART-B (50 marks)

3. What are the seven crystal systems and Bravais lattices. Explain with neat diagrams. 10M

OR

4. a) Describe Davisson and Germer's experiment to verify the de-Broglie hypothesis. 7M
   b) Determine the de-Broglie wavelength of a electron moving in an external electric field of potential 1600V starting from rest. 3M

5. a) Classify the different types of materials based on band theory 5M
   b) write a short note on effective mass of electron 5M

OR

6. What is an intrinsic semiconductor? Calculate the carrier concentration of electrons in the conduction Band of an intrinsic semiconductor. 10M

7. a) What is a local field ? Calculate the local field of a dielectric 7M
   b) The dielectric constant of a material is 1.0000583. The density of the material is 2.5×10^{25} atoms/m^3. Then find the electronic polarizability of the material 3M

OR

8. a) Explain the different steps in Hysteresis loop? 6M
b) Write any four differences between Soft and Hard magnetic materials. 4M

9. a) Describe the construction and working of He-Ne laser. 7M
b) Write any three applications of Laser. 3M

OR

10. a) Write the applications of optical fibre and discuss optical communication system with block Diagram. 10M

11. a) What are Physical, chemical and Optical properties of a Nano- material 6M
b) What is Nano Technology? Give a brief note. 4M

OR

12) a) Write in brief about the following
i) Fiber reinforced plastics 5M
ii) Fiber reinforced metals 5M