

MLR INSTITUTE OF TECHNOLOGY

(An Autonomous Institution)

B.Tech I Year I Sem Examinations , January-2016

ENGINEERING PHYSICS

(Common to Aero,CSE & IT)

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 carries 10 marks and may have a, b, c as sub questions.

PART-A

(25 Marks)

- 1.a) Write the differences between monoclinic and triclinic systems. (2)
- b) Write any two differences between Bose-Einstein and Fermi Dirac Distributions. (2)
- c) Write any two differences between intrinsic and extrinsic semiconductors. (2)
- d) Write any four applications of optical fibers. (2)
- e) What is nanotechnology? Write any three advantages of it. (2)
- 2.a) The wavelength of Yellow light is 5890 \AA . What is the energy of the photons in electron volts. (3)
- b) What is Hall Effect? Write any three applications of it. (3)
- c) Write any three differences between electronic and orientation polarizations. (3)
- d) Write any three advantages of He-Ne over Ruby laser. (3)
- e) Write three advantages and three disadvantages of top down method. (3)

PART-B

(50 Marks)

- 3.a) What is packing fraction? Derive the packing fraction for SC, BCC and FCC. (5)
- b) What are Miller Indices? How are they determined? Draw (110), (011) planes of a cubic unit cell. (5)

OR

- 4.a) Describe Davisson and Germer's experiment and write the importance of it. (6)
- b) Determine the wavelength of electrons which are accelerated through a p.d of 125 V. (4)
- 5.a) Explain Maxwell Boltzmann, Bose Einstein and Fermi Dirac statistics. (6)
- b) Explain the origin of Energy band formation in solids. (4)

OR

- 6.a) Derive an expression for Fermi level in a p-type semiconductor and hence obtain an expression for carrier concentration. (5)
- b) Explain Hall Effect with a neat diagram and write the advantages. (5)

- 7.a) Define electric dipole, dipole moment, polarizability, electric susceptibility, Displacement vector. (5)
b) A dielectric has a relative dielectric constant of 12. It contains 5×10^{28} atoms/m³. Calculate its electronic polarizability (permittivity of free space = 8.854×10^{-12} F/m) (5)

OR

- 8.a) Define Bohr Magneton and write any four differences between dia and ferro magnetic materials with examples. (5)
b) Write the applications of hard and soft magnetic materials with examples. (5)
- 9.a) Define spontaneous emission and stimulated emission and write any four differences between them. (5)
b) Define Einstein coefficients and derive relation between them. (5)

OR

- 10.a) Explain the structure of optical fibers. Write any six advantages and six applications of them. (5)
b) Describe the optical fiber communication with block diagram. (5)
- 11.a) Write the advantages and disadvantages of sol-gel method and CVD method. (5)
b) Explain the working procedure of SEM with a neat diagram. (5)

OR

- 12.a) What are BIOMATERIALS? Write any nine applications of them. (5)
b) Define high temperature materials and smart materials and write their applications. (5)