R13

JAWAHARLAL NEHRU TECHNOLOGICAL UNIVERSITY HYDERABAD
B.Tech I Year Examinations, December - 2017
ENGINEERING PHYSICS
(Common to CE, EEE, ME, ECE, CSE, CHEM, EIE, IT, MCT, ETM, MMT, AE, AME, MIE, PTM, MSNT, AGE)

Time: 3 hours   **Max. Marks: 75**

Note: This question paper contains two parts A and B.
Part A is compulsory which carries 25 marks. Answer all questions in Part A.
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) What is unit cell? [2]
 b) What are the Miller indices? How they are obtained? [3]
 c) Define de-Broglie's hypothesis. [2]
 d) What are the matter waves? [3]
 e) Define Electric Susceptibility. [2]
 f) Distinguish between Soft and Hard Magnetic Materials. [3]
 g) Define interference. [2]
 h) Explain Population Inversion. [3]
 i) Define Time of Reverberation. [2]
 j) What are the nanomaterials? [3]

PART-B

(50 Marks)

2.a) Describe seven crystal structures with diagrams.
 b) Derive an expression for packing factor of BCC crystals.
 c) Write notes on point defects. [3+4+3]
OR
3.a) Describe in detail the structure of Diamond.
 b) Calculate the ratio d_{100}: d_{110}: d_{111} for simple cubic structure.
 c) Write a note on Frenkel and Schottky Defects. [4+3+3]

4.a) Describe Davisson and Germer's Experiment.
 b) Explain Maxwell-Boltzmann distribution law.
 c) Derive an expression for effective mass of an electron. [4+3+3]
OR
5.a) Explain Heisenberg's Uncertainty Principle.
 b) Describe Kronig-Penny Model.
 c) Write a note on Phase space and Ensembles [3+4+3]

www.ManaResults.co.in

6.a) Describe the phenomenon of electronic polarization and obtain an expression for electronic polarizability.
  b) Explain Domain Theory of Ferro Magnetism on the basis of Hysteresis Curve.
  c) Write a note on Meissner Effect. [4+4+2]

OR

7.a) Derive an equation for Bohr Magneton.
  b) Explain Classification of Dia, Para and Ferro Magnetic Materials on the basis of Magnetic Moment.
  c) Distinguish between Type-I & Type-II Superconductors. [3+4+3]

8.a) Describe Newton rings experiment.
  b) Explain construction of Nicol prism.
  c) Derive an expression for acceptance angle and numerical aperture. [3+3+4]

OR

9.a) What is Double refraction?
  b) Describe construction and working principle of Ruby laser system.
  c) Write the important applications of optical fibers. [3+4+3]

10.a) What is Hall effect?
  b) Describe construction and working principle of LED.
  c) Describe Sol-gel method for the preparation of nanomaterials. [2+4+4]

OR

11.a) Discuss construction of Photo Diodes.
  b) Derive an expression for Sabine's Formula for Reverberation Time.
  c) Explain the quantum confinement effects in nanomaterials. [3+4+3]