

I/IV B.Tech. DEGREE EXAMINATIONS, NOV/DEC-2017

Second Semester

CSE/ECE/EEE

ENGINEERING PHYSICS-II

Time: Three Hours

Maximum marks:60

Answer Question No.1 Compulsory

12X1=12 M

Answer ONE Question from each Unit

4X12=48 M

1.
 - a) What are matter waves?
 - b) Expression for wavelength of matter wave.
 - c) What is effective mass of an electron
 - d) Define Fermi energy
 - e) What is Hall effect
 - f) What is Hysteresis?
 - g) Write down the characteristics of superconductors.
 - h) What are dielectrics?
 - i) Give two main characteristics of ferroelectric materials.
 - j) Give electrical properties of Carbon nano tubes.
 - k) What is solar cell?
 - l) What is Superconductivity?

UNIT-I

2.
 - a) Explain the concept of dual nature of light?
 - b) By applying uncertainty principle explain non-existence of electrons in atomic nucleus.

(OR)

3.
 - a) Give the physical significance of wave function.
 - b) Derive Schrodinger time independent wave equation.

UNIT-II

4.
 - a) Explain the classical free electron theory of metals.
 - b) Define Fermi energy. What is the relation of Fermi energy with the concentration of electrons in the metals.

(OR)

5.
 - a) Explain the origin of energy bands in detail.

P.T.O

- b) How does the band theory of solids lead to the classification of solids into conductors, semiconductors and insulators?

UNIT-III

6. a) Explain:(i) Electric dipole moment, (ii) Polarisation and (iii) Dielectric constant
b) Mention applications of dielectric materials.

(OR)

7. a) What is Bohr magneton? Explain.
b) What are hard and soft magnetic materials? Mention their characteristics and uses.

UNIT-IV

8. a) Explain: (i) Transition temperature (T_c), (ii) Critical magnetic field (H_c) and (iii) Critical current (I_c)
b) What is BCS theory of superconductivity?

(OR)

9. a) What are Carbon nano tubes? Explain different methods of production of carbon nano tubes.
b) Give some applications of nano materials.



I/IV B. Tech. DEGREE EXAMINATIONS, JUNE / JULY 2017**SECOND SEMESTER****BT / CSE / ECE / EEE****ENGINEERING PHYSICS - II**

Time : Three Hours**Maximum Marks : 60****Answer Question No. 1 Compulsory.****12x1=12 M****Answer ONE question from each Unit.****4x12=48 M**

1. Write the following in brief :
 - a) Write expression for 1 - D Schrodinger's wave equation.
 - b) Write expression for Heisenberg's uncertainty principle.
 - c) Define drift velocity.
 - d) What is fermi energy ?
 - e) Write expression for concept of effective mass of electron.
 - f) What is photo diode ?
 - g) Define Polarizability ?
 - h) Write equation for de-Broglie wavelength ?
 - i) What is Meissner's effect ?
 - j) Write any two applications of super conductors ?
 - k) Write any two applications of CNT's.
 - l) What is nano scale ?

UNIT - I

2. a) Write about Heisenberg's principle.
 - b) Describe the experiment of Davisson and Germer to demonstrate it.

(OR)

3. a) What is physical significance of wave function ?
 - b) Describe Particle in a potential well, $V=0$ and $V = \infty$.

P.T.O.

UNIT - II

4. a) Explain Hall Effect and its uses.
b) Explain the fermi-dirac distribution function of the electron. Explain the effects of temperature on it.

(OR)

5. a) What is Bloch Theorem ?
b) Discuss the formation of allowed and forbidden energy bands on the basis of Kronig-Penney model.

UNIT - III

6. a) Describe various types of Polarization.
b) Explain the properties of Ferroelectrics and mention their applications.

(OR)

7. a) Define magnetic moment of an atom.
b) Discuss the classifications of Dia, Para, and Ferro magnetic materials on the basis of magnetic moment.

UNIT - IV

8. a) Explain type I and II super conductors.
b) Explain Solar cell and its characteristics.

(OR)

9. a) What is nano-technology and discuss the fabrication of nano material using Sol-Gel method.
b) Discuss brief about Carbon nanotubes.

