R19

Code: 19A56101T

B.Tech I Year I Semester (R19) Regular Examinations January 2020
APPLIED PHYSICS
(Common to EEE, ECE & EIE)

Time: 3 hours   Max. Marks: 70

PART – A
(Compulsory Question)
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1   Answer the following: (10 X 02 = 20 Marks)
- (a)   Write the principle of superposition.
- (b)   What is called grating element?
- (c)   How do you define ferroelectricity in dielectrics?
- (d)   Write the mathematical relation between magnetic susceptibility and permeability.
- (e)   What do you mean by an electromagnetic wave?
- (f)   Explain the principle of an optical fibre.
- (g)   Define Fermi energy.
- (h)   What is the value of energy gap in semiconductors?
- (i)   Mention the properties of superconductors.
- (j)   What is nanometer?

PART – B
(Answer all five units, 5 X 10 = 50 Marks)

UNIT – I

2   (a)   Explain Newton's rings experiment with a neat diagram and obtain the condition for dark and bright fringe diameters.
- (b)   Write any four important applications of polarization.

OR

3   (a)   Describe Fraunhofer diffraction due to double slit.
- (b)   In Newton's rings experiment, the diameters of the 4th and 25th rings are 0.3 cm and 0.8 cm, respectively. Find the wavelength of light. Given R = 100 cm.

UNIT – II

4   (a)   Obtain an expression for the internal field seen by an atom in an infinite array of atoms subjected to an external field.
- (b)   A magnetic material has a magnetization of 3300 A/m and flux density of 0.0044 Wb/m^2. Calculate the magnetizing force and the relative permeability of the material.

OR

5   (a)   Discuss ferroelectricity in dielectric materials.
- (b)   What are the differences between soft and hard magnetic materials?

UNIT – III

6   (a)   State and prove Stokes theorem. Give its importance.
- (b)   Write brief note on fibre optic sensors.

OR

7   (a)   State Gauss's law for electric and magnetic fields.
- (b)   Explain in detail about refractive index profile of graded index optical fibre.

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UNIT – IV

8 (a) How do you distinguish between intrinsic and extrinsic semiconductors giving suitable examples?
   (b) Explain the origin of energy bands in solids.

OR

9 (a) Describe Hall effect in a semiconductor along with its applications.
   (b) Write important applications of semiconductors.

UNIT – V

10 (a) Distinguish between type-1 and type-2 superconductors.
    (b) Write the applications of nanomaterials in different fields.

OR

11 (a) Write a short note on BCS theory.
    (b) Describe the synthesis of nanomaterials by chemical vapour deposition technique.

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