PVP 20

Code: 20BS1103

I B.Tech - I Semester – Regular Examinations – JULY 2021

ENGINEERING PHYSICS

(Common to CSE, IT)

Duration: 3 hours Max. Marks: 70

Note: 1. This paper contains questions from 5 units of Syllabus. Each unit carries 14 marks and have an internal choice of Questions.
2. All parts of Question must be answered in one place.

UNIT – I

1. a) State and explain the principle working of optical fiber with a neat sketch. 7 M
   b) On what basis optical fibers are classified? Explain in detail the types of optical fibers. 7 M

OR

2. a) Does optical fibers are advantageous in communication field? Analyze your answer. 10 M
   b) For a step index fiber with core of refractive index 1.48 and numerical aperture of 0.649. Calculate the refractive index of cladding material and also acceptance angle. 4 M

UNIT – II

3. a) What is dielectric material? Explain what happens to dielectric material when subjected to external electric field? Deduce Clausius- Mossotti relation. 8 M

b) Calculate Electric displacement and polarization if the dielectric constant of medium is 6, Electric field in the dielectric is 10^6 V/m. Take permittivity of free space is $8.85x10^{-12}$ F/m . 6 M

OR

4. a) Define Hysteresis. Compare soft and hard magnetic materials. 8 M

b) The magnetic field intensity in a piece of ferric oxide is 10^6 A/m. If the susceptibility of the material is $1.5x10^{-3}$. Calculate the magnetization of the material and flux density. 6 M

UNIT-III

5. a) Show that the electric field due to thin sheet of charge is uniform by using Gauss law in electrostatics. 8 M

b) State Gauss law in electrostatics and deduce Coulombs law from Gauss law. 6 M

OR

6. a) Can we generate electric current using magnetism? If so what is the mechanism so called? State and Explain the Faradays law. 8 M

b) Write down the Maxwells equations. 6 M

UNIT – IV

7. a) List various differences between pure and impure semiconductors 6 M

b) What is Fermi level? Does it depend on temperature?

Explain how does it changes with temperature in pure semiconductors? 8 M

OR

8. a) Analyze concentration of electrons and holes in intrinsic semiconductor and derive an expression for it 10 M

b) Define energy band. Discuss about generation and recombination process. 4 M

UNIT – V

9. a) State Hall effect. Deduce the expression for Hall coefficient with a neat diagram 7 M

b) Outline the construction and working of a photodiode 7 M

OR

10. a) Explain the V-I characteristics of P-N junction diode and draw the neat diagram of Volt-Ampere characteristics of P-N junction diode. 8 M

b) What do you mean by direct and indirect band gap semiconductors? Describe them. 6 M