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SIDDHARTH INSTITUTE OF ENGINEERING & TECHNOLOGY:: PUTTUR
(AUTONOMOUS)

B.Tech I Year II Semester Supplementary Examinations February-2022

ENGINEERING PHYSICS

(Common to ECE, CSE & CSIT)

Time: 3 hours

Max. Marks: 60

(Answer all Five Units 5 x 12 = 60 Marks)

UNIT-I

- 1 a Describe the important characteristic of laser beam? 6M
b Derive the relation between the various Einstein's coefficients of absorption and emission of radiation. 6M

OR

- 2 a What is the acceptance angle of an optical fibre and derive an expression for it. 8M
b An optical fibre has a numerical aperture of 0.20 and cladding refractive index of 1.59. Determine the refractive index of core and the acceptance angle for the fibre in water has a refractive index of 1.33. 4M

UNIT-II

- 3 a State and explain Bragg's law of X-ray diffraction. 6M
b Draw miller indices of planes (1 0 0) and (1 0 1). Find the ratio $d_{100} : d_{110} : d_{111}$ for a simple cubic structure. 6M

OR

- 4 a Explain the detection methods of Ultrasonic waves. 6M
b Describe the application of Ultrasonic in non destructive testing (NDT) of material. 6M

UNIT-III

- 5 a Derive Schrödinger's time dependent wave equation. 8M
b Explain the physical significance of wave function. 4M

OR

- 6 a What are the salient features of classical free electron theory and write its drawbacks? Derive an expression for electrical conductivity in a metal 10M
b An electron is moving under a potential field of 15kv. Calculate the wavelength of electron wave. 2M

UNIT-IV

- 7 a Derive the expression for intrinsic carrier concentration. 6M
b Explain Drift processes in semiconductors. 6M

OR

- 8 a Describe the Hall effect in a semiconductor. Write the applications of Hall effect. 6M
b Define i) magnetic moment ii) magnetic permeability. 6M

UNIT-V

- 9 a What is Meissner effect? Explain Josephson effect in superconductors. 9M
b A superconducting material has a critical temperature of 3.7K and a magnetic field of 0.0306T at 0K. Find the critical field at 2K. 3M

OR

- 10 a What is nanomaterial? Write the classification of nanomaterials 4M
b Explain ball milling technique for synthesis of nanomaterial. 8M

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