

Code No: 152AE

JAWAHARLAL NEHRU TECHNOLOGICAL UNIVERSITY HYDERABAD**B.Tech I Year II Semester Examinations, August - 2019****APPLIED PHYSICS****(Common to EEE, CSE, IT)****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) Define Compton effect. [2]
- b) Draw Zener diode symbol and explain any one break down mechanism. [2]
- c) Write any four applications of LED. [2]
- d) What is the need of the Pumping process in lasers? [2]
- e) Define dielectric constant. [2]
- f) Explain the significance of Quantum physics. [3]
- g) Distinguish between Intrinsic and Extrinsic semiconductors. [3]
- h) Explain term recombination mechanisms in semiconductors. [3]
- i) Explain total internal reflection. [3]
- j) What is significance of permeability in magnetic materials? [3]

PART-B**(50 Marks)**

- 2.a) With neat diagram explain Davisson and Germer experiment. [5+5]
 - b) Write a note on Black body radiation. [5+5]
- OR**
- 3.a) Derive an expression of Schrodinger's time independent wave equation. [6+4]
 - b) Discuss Heisenberg's Uncertainty principle. [6+4]
- 4.a) How Zener diode is different to normal diode? Draw its V-I Characteristics. [6+4]
 - b) Explain the term diffusion and drift. [6+4]
- OR**
- 5.a) Explain construction, Principle of operation of Bipolar Junction Transistor (BJT). [6+4]
 - b) Discuss formation of p-n junction diode. [6+4]
- 6.a) Describe in detail, with a neat diagram Solar cell construction and working principle. [5+5]
 - b) In detail discuss PIN diode working principle. [5+5]
- OR**
- 7.a) With neat diagram explain construction and working principle of semiconductor laser. [6+4]
 - b) What are the characteristics of LED? [6+4]

- 8.a) With necessary theory and energy level diagram explain the working of Ruby laser.
b) With help diagrams explain differences between Step and Graded index optical fibers? [5+5]

OR

- 9.a) Explain how Optical fiber acted as a dielectric wave guide.
b) Describe Population and Population inversion in lasers. [5+5]

- 10.a) Explain clearly the phenomenon of ferro electricity.
b) What is Piezoelectricity? Write the applications of Piezoelectricity materials. [5+5]

OR

- 11.a) What are Laws of electrostatics.
b) Explain Hysteresis of a ferromagnetic material. [5+5]

---ooOoo---