Code No: 152AE

R18

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

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