Code No: 132AA **R16**

JAWAHARLAL NEHRU TECHNOLOGICAL UNIVERSITY HYDERABAD
B.Tech I Year II Semester Examinations, May - 2019
ENGINEERING PHYSICS – II
(Common to EEE, ECE, CSE, EIE, IT, ETM)

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)	Explain dual nature of light.	[2]
b)	Define de-Broglie's hypothesis.	[3]
c)	Define Fermi energy level at 0K.	[2]
d)	Draw V-I Characteristic curve of PN junction diode.	[3]
e)	Define Polarization vector.	[2]
f)	Explain pyro electricity.	[3]
g)	Define magnetic susceptibility.	[2]
h)	Distinguish between soft and hard magnetic materials.	[3]
i)	What is nano size? Explain briefly.	[2]
j)	Write any two applications of nanomaterials.	[3]

PART-B

(50 Marks)

2.a)	With neat diagram explain Davisson and Germer's experiment.	
b)	Describe formation of energy bands in solids.	[5+5]
	OR	
3.a)	Derive Schrödinger's time independent wave equation.	
b)	Explain physical significance of wave function (ψ).	[5+5]
4.a)	Distinguish between direct and indirect band gap semiconductors.	
b)	Determine the concentration of the charge carriers in conduction band of intrinsic semiconductors.	[4+6]
	OR	
5.a)	Explain formation of PN junction diode.	
b)	Describe construction and working principle of Solar Cell.	[4+6]
6.a)	Derive an expression for Clausius-Mosotti relation.	
b)	Describe Ferro electricity of a dielectric material.	[5+5]
	OR	
7.a)	Derive an expression for electronic polarizability.	
b)	Discuss Piezo electricity of a dielectric material.	[5+5]

8.a) Discuss classification of magnetic materials.
b) Explain hysteresis curve based on domain theory of ferro magnetism. [5+5]

OR

9.a) What is Meissner's effect? Write any two applications of superconductors.
b) Derive an expression for Bohr magneton. [5+5]

10.a) Explain how surface to volume ratio varies in nano materials.
b) Describe preparation of nanomaterials by using Sol-Gel method. [4+6]

OR

11.a) Explain Quantum confinement.
b) Explain how the nanomaterials are characterized by using SEM and TEM. [4+6]

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