MARRI LAXMAN REDDY
INSTITUTE OF TECHNOLOGY AND MANAGEMENT
(AN AUTONOMOUS INSTITUTION)
(Approved by AICTE, New Delhi & Affiliated to JNTUH, Hyderabad)
Accredited by NBA and NAAC with 'A' Grade & Recognized Under Section2(f) & 12(B)of the UGC act,1956

MLRS

I B.TECH II Sem Supplementary Examination, December-2021
APPLIED PHYSICS
(EEE, CSE, IT)

Time: 3 Hours.   Max. Marks: 70

Note: 1. Question paper consists: Part-A and Part-B.
   2. In Part – A, answer all questions which carries 20 marks.
   3. In Part – B, answer any one question from each unit.
      Each question carries 10 marks and may have a, b as sub questions.

PART- A
(10*2 Marks = 20 Marks)

1. a)	Define black body.	2M	CO1	R
b)	State and explain photo electric effect.	2M	CO1	U
c)	Differentiate intrinsic and extrinsic semiconductors.	2M	CO2	U
d)	Explain recombination phenomenon.	2M	CO2	U
e)	Explain solar cell characteristics.	2M	CO3	U
f)	On what phenomenon the semiconductor laser works.	2M	CO3	R
g)	Brief population inversion.	2M	CO4	R
h)	Define critical angle and total internal reflection.	2M	CO4	R
i)	State polarization in dielectrics.	2M	CO5	R
j)	Define permeability and susceptibility and write the relation between them.	2M	CO5	U

PART- B
(10*5 Marks = 50 Marks)

2 a)	Explain de-Broglie hypothesis and obtain its wavelength equation.	5M	CO1	U
b)	Describe Davisson and Germer experiment and how can it be useful to explain the wave nature of an electron.	5M	CO1	Ap

OR

3	Derive time independent Schrodinger wave equation and show that the energy of the particle in a box is quantized.	10M	CO1	Ap

4 a)	Explain the v-i characteristics of a p-n junction diode.	5M	CO2	R
b)	State and explain Hall effect.	5M	CO2	U

OR

5	Describe the construction and working of a bipolar junction transistor and explain its principle of operation.	10M	CO2	U

6	a)	Explain the radiative mechanisms in a semiconductor.	5M	CO3	R
	b)	What the materials used in semiconductor lasers and explain figure of merit?	5M	CO3	U

OR

7		Describe the working of avalanche and PIN detectors.	10M	CO3	U

8	a)	Describe the construction and working of Ruby laser with a neat energy level diagram.	5M	CO4	U
	b)	What are the different engineering and medical applications of lasers?	5M	CO4	R

OR

9		Explain the light propagation through optical fibres and derive the expressions for acceptance angle and numerical aperture.	10M	CO4	U

10	a)	Derive equation of continuity and explain its significance.	5M	CO5	R
	b)	State and explain Maxwell's equation in electromagnetism and give the importance.	5M	CO5	U

OR

11		Explain the classification of magnetic materials and write the characteristics and applications of ferri and antiferro magnetic materials.	10M	CO5	U

---oo0oo---