R20 Regulation *Subject code:3B1AL*

TKR COLLEGE OF ENGINEERING AND TECHNOLOGY

(Autonomous, Accredited by NAAC with 'A+' Grade)

B.Tech I Semester Supplementary Examinations, July 2025

APPLIED PHYSICS

(ECE)

Maximum Marks: 70 Date: 16.07.2025 Duration: 3 hours

Note: **1.This question paper contains two parts A and B.**
2. Part A is compulsory which carries 20 marks. Answer all questions in Part A.
3. Part B consists of 5 Units. Answer any one full question from each unit.
4. Each question carries 10 marks and may have a, b, c, d as sub questions.

Part-A

All the following questions carry equal marks (10X2M=20 Marks)		Marks	CO	BTL
1	Explain Relaxation time.	2M	1	L1
2	Define Mean free path.	2M	1	L1
3	What are intrinsic and extrinsic semiconductors give two examples of them.	2M	2	L1
4	List the applications of Hall effect.	2M	2	L1
5	Explain photovoltaic effect.	2M	3	L1
6	Write a about Optical loss and gain.	2M	3	L1
7	What are the materials used for the construction of LED?	2M	4	L1
8	What is quantum wire laser?	2M	4	L1
9	Write the difference between PIN and Avalanche photo diodes.	2M	5	L1
10	What is the working principle of a Solar cell?	2M	5	L1

Part-B

Answer All the following questions. (5X10M=50Marks)		Marks	CO	BTL
11	Derive an expression for Density of states in an atom.	10M	1	L2
	OR			
12	What is the effective mass of electron? Obtain the expression for effective mass of electron.	10M	1	L2
13	Calculate the carrier concentration for N -type semiconductor.	10M	2	L2
	OR			
14	Calculate the carrier concentration for P- type semiconductor.	10M	2	L2
15	Explain about Joint density of states of photons.	10M	3	L2
	OR			
16	Explain about different types of Hetero structures.	10M	3	L2
17	Explain in detail LED structure and characteristics.	10M	4	L2
	OR			
18	Explain the structure and working of hetro junction semiconductor laser.	10M	4	L2
19	Explain general properties and different types of photo detectors.	10M	5	L2
	OR			
20	What is solar cell, Explain I-V characteristics of a solar cell.	10M	5	L2