R20 Regulation *Subject code: 3B2AF*

TKR COLLEGE OF ENGINEERING AND TECHNOLOGY

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

B.Tech II Semester Supplementary Examinations, June 2024

APPLIED PHYSICS

(Common to EEE,CSE,CSE(AI&ML),CSE(DS) & IT)

Maximum Marks: 70 Date:26.06.2024 **Duration: 3Hours**

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 10 questions. Answer any 5 questions which carries 10M.
4. Each question carries 10marks and may have a, b, c, d as sub questions.

	Part-A		
All the following questions carry equal marks (10X2M=20 Marks)		Bloom's Tx	CO
1	Explain the terms relaxation time and mean free path.	L1	CO1
2	Explain the classification of metals, semiconductors & insulators?	L1	CO1
3	Define intrinsic semiconductors.	L1	CO2
4	What is recombination?	L2	CO2
5	Explain the different ways of band gap modification.	L1	CO3
6	Define Photo voltaic effect.	L1	CO3
7	What is a direct and indirect band gap semiconductor?	L1	CO4
8	Write the symbol of LED.	L1	CO4
9	What is a photo detector?	L2	CO5
10	Mention two applications of PIN diodes?	L2	CO5
	Part-B		
Answer all the questions (5X10M=50Marks)			
11	Explain and derive an expression for Density of states. (10M)	L2	CO1
	OR		
12	Explain and derive an expression for Effective mass with neat diagram. (10M)	L2	CO1
13	Calculate the carrier concentration in N type semiconductor. (10M)	L3	CO2
	OR		
14	What is Hall effect? Derive an expression for Hall Coefficient? (10M)	L3	CO2
15	Explain the optical transitions in bulk semiconductor (absorption, spontaneous emission and stimulated emission) and deduce the relation between Einstein's coefficients. (10M)	L1	CO3
	OR		
16	What are optical joint density states? Derive expression for optical joint density of states. (10M)	L1	CO3

17	Explain the construction and working of LED? (10M)	L2	CO4
	OR		
18	What is semiconductor diode laser? Explain its construction and working? (10M)	L2	C04
19	Mention the general properties of semiconductor photo detectors and explain their uses? (10M)	L2	CO5
	OR		
20	Explain the construction and working of Avalanche Photo diode. (10M)	L2	CO5