R20 Regulation *Subject code: 3B1AL*

TKR COLLEGE OF ENGINEERING AND TECHNOLOGY

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

B.Tech I Semester Supplementary Examinations, June 2024

Applied Physics

(Electronics and Communication Engineering)

Maximum Marks: 70 Date:01.07.2024 **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 Tx**	**CO**
1	What is block theorem?	L1	CO1
2	What are the drawbacks of Classical free electron theory	L1	CO1
3	What is meant by intrinsic semiconductors? Write examples?	L1	CO2
4	Write the applications of Hall effect?	L2	CO2
5	Explain the different ways of band gap modification.	L1	CO3
6	Explain Photo electric effect	L1	CO3
7	What is a direct and indirect band gap semiconductor?	L1	CO4
8	What is a quantum dot?	L1	CO4
9	What is photovoltaic effect?	L2	CO5
10	Mention the applications of PIN diode.	L2	CO5

Part-B

	Answer all the questions **(10MX 5=50Marks)**		
11	Explain classical free electron theory and obtain expression for conductivity of a metal. [10]	L2	CO1
	OR		
12	Explain Kronig-Penny model. [10]	L1	CO1
13	Calculate the carrier concentration in N type semiconductor. [10]		
	OR		
14	What is Hall effect? Derive an expression for Hall Coefficient? [10]	L3	C02
15	Explain the optical transitions in bulk semiconductor (absorption, spontaneous emission and stimulated emission) and deduce the relation between Einstein's coefficients. [10]	L1	CO3
	OR		
16	What are optical joint density states? Derive expression for optical joint density of states. [10]	L1	CO3
17	What are Quantum well based lasers? Explain. [10]	L2	CO4
	OR		
18	A. What is the basic principle of working of LED. [5]	L2	CO4

	B. Calculate the band gap energy of a semiconductor whose output wavelength is 1.86μm in eV. [5]		
	OR		
19	What is Avalanche photo diode? Explain its construction. [10]	L2	CO5
	OR		
20	What is a solar cell? Describe its construction and working. [10]	L2	CO5