R22 Regulation *Subject code: 4B1AB*

TKR COLLEGE OF ENGINEERING AND TECHNOLOGY

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

B.Tech I Semester Supplementary Examinations, June 2024

Engineering Physics

(Common to CE,EEE & ECE)

Maximum Marks: 60 Date:01.07.2024 Duration: 3 hours

Note: **1.This question paper contains two parts A and B.**
2. Part A is compulsory which carries 10 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 (10X1M=10 Marks)	CO No.	Bloom Tx
1.	a	What is wave particle duality in quantum mechanics?	1	I
	b	State Bloch theorem in the band theory.	1	II
	c	Distinguish between direct and indirect band gap semiconductor.	2	II
	d	Mention the applications of Hall effect.	2	III
	e	Define the term dielectric susceptibility.	3	I
	f	What are super ionic conductors?	3	III
	g	What are soft and hard magnetic materials?	4	I
	h	Give four examples for superconductors.	4	I
	i	List the role of Nitrogen in He-Ne laser.	5	II
	j	Define Numerical Aperture of optical fiber.	5	I

Part-B

	Answer All the following questions. (5X10M=50Marks)		
2	Derive Schrodinger's time independent wave equation and explain physical significance of wave function. (10)	1	IV
	OR		
3	Describe the band theory of solids in detail and classify solids into conductors, semiconductors and insulators with neat diagrams. (10)	1	III
4	Derive an expression for carrier concentration in a p-type semiconductor and discuss the variation of same with temperature. (10)	2	IV
	OR		
5	With a neat diagram, Summarize the working of a PN junction diode in forward bias and reverse bias. (10)	2	III
6	Explain the phenomenon of ferroelectric hysteresis and ferroelectric applications. (10)	3	III
	OR		
7	Describe the construction and working of super capacitors . (10)	3	III

8	Discuss the classification of different types of magnetic materials. (10)	4	II
	OR		
9	Explain the important applications exhibited by superconductors and add a note on magnetic levitation. (10)	4	III
10	Explain the principle, construction and working of semiconductor laser. List its applications. (10)	5	II
	OR		
11	Give a detailed account of the construction and application of optical fibers. Also furnish the various losses in optical fibers. (10)	5	III