R22 Regulation *Subject code:4B2AN*

TKR COLLEGE OF ENGINEERING AND TECHNOLOGY

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

B.Tech II Semester Supplementary Examinations, June 2026

APPLIED PHYSICS

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

Maximum Marks: 60 Date: 24.06.2026 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 (10X1M=10 Marks)		Marks	CO	BTL
1.a	What is wave and particle.	1M	1	1
b	What is de-Broglie's hypothesis.	1M	1	1
c	Define fermi level.	1M	2	1
d	What is meant by drift velocity.	1M	2	2
e	Define energy gap.	1M	3	1
f	What is meant by Hall Effect?	1M	3	1
g	Define indirect band gap semiconductors.	1M	4	2
h	What is the working principle of solar cell?	1M	4	1
i	Define numerical aperture.	1M	5	2
j	Explain Qubit state.	1M	5	2

Part-B

Answer All the following questions. (5X10M=50Marks)		Marks	CO	BTL
2	Derive Schrödinger's time independent wave equation.	10M	1	3
	OR			
3	Describe Davisson and Germer's experiment in support of the existence of matter waves.	10M	1	2
4	Derive an expression for density of states.	10M	2	2
	OR			
5	What is Bloch's theorem? Explain motion of an electron in a periodic potential.	10M	2	2
6	Derive an expression for the carrier concentration in a N-type semiconductor and explain the variation of the fermi level with temperature?	10M	3	2
	OR			
7	Define Hall effect? Derive an expression for Hall coefficient of a given semiconductor.	10M	3	2

8	Explain the construction and working of LED.	10M	4	2
	OR			
9	What is electronic polarization explain? Obtain an expression for electronic polarization.	10M	4	3
10	Explain in detail about optical fiber in communication system.	10M	5	2
	OR			
11	Explain the CNOT gate with truth table and write it's applications	10M	5	2