



R22 Regulation

**TKR COLLEGE OF ENGINEERING AND TECHNOLOGY**  
(Autonomous, Accredited by NAAC with 'A' Grade)

Subject code: 4B1AB

**B.Tech I Semester Regular Examinations, March/April 2023**  
**Engineering Physics**

(Common to CE, EEE and ECE)

Maximum Marks: 60

Date: 10.04.2023 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

1. a Write de-Broglie wavelength equation in terms of kinetic energy. (10x1M=10 Marks)  
b Define the forbidden gap.  
c State the Hall effect.  
d What is the working principle involved in LED?  
e Define the dielectric susceptibility.  
f What do you understand about a super capacitor?  
g What is meant by ferromagnetic domain?  
h Define the critical magnetic field.  
i Mention various types of pumping in lasers.  
j Define the acceptance angle in fibers.

Part-B

Answer All the following questions.

(5X10M=50Marks)

- 2 a) Discuss the Heisenberg's uncertainty principle. [4]  
b) Based on energy band structures explain how the solids are classify into conductors, insulators and semiconductors. [6]  
OR
- 3 Derive an equation for time independent Schrodinger wave equation. [10]
- 4 What is solar cell? Explain the construction and working of solar cell. [10]  
OR
- 5 Derive an expression for carrier concentration of holes in valance band for an intrinsic semiconductor. [10]
- 6 a) Write a note on Ferro electricity. [5]  
b) Explain about the solid fuel cells. [5]  
OR
- 7 a) Write the applications of dielectrics. [5]  
b) Write a note on recharable batteries. [5]

- 8 a) Explain the Type-I & Type-II superconductors. [5]  
b) List out any five applications of Superconductor. [5]  
OR
- 9 Explain the classifications of magnetic materials as Dia, Para and Ferro. [10]
- 10 Differentiate the step and graded index fibers based on their refractive index profiles. [10]  
OR
- 11 Explain the construction and working of a He-Ne gas laser. [10]