R22 Regulation

Subject Code:4B1AB

TKR COLLEGE OF ENGINEERING AND TECHNOLOGY

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

Engineering Physics

(Common to CE, EEE and ECE)

Maximum Marks: 60

Date:03.10.2023 **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 (10x1M=10 Marks)

1a Define de-Broglie's hypothesis.
b List two properties of matter waves.
c Write the significance of wave function?
d Define intrinsic semiconductors.
e What is the working principle of LED.
f Mention four types of polarization mechanisms.
g Explain magnetic hysteresis.
h Define magnetic susceptibility.
i Name the principle of optical fiber.
j Define Numerical aperture.

Part-B

Answer All the following questions. (10MX 5=50Marks)

2 Derive the time independent Schrodinger wave equation. [10]

OR

3 Explain the origin of energy band formation and classify materials into conductors, semiconductors and insulators. [10]

4 Derive expression for the carrier concentration of electrons in an intrinsic semiconductor. [10]

OR

5 Describe the construction and working of LED. [10]

6 Define electronic polarization and obtain expression for electronic polarizability. [10]

OR

7 Explain the construction and working of Lithium-ion battery. [10]

8 a) Explain Meissner effect. [5]
b) Differentiate between Type-I and Type-II superconductors. [5]

OR

9 a) Classify magnetic materials. [5]
b) Differentiate Soft and Hard magnetic materials. [5]

10 Explain the terms [10]
a) spontaneous emission b)stimulated emission c)population inversion
d)pumping e) absorption

OR

11 Explain the construction and working of Ruby laser. [10]