R22 Regulation

Subject code: 4B1AK

TKR COLLEGE OF ENGINEERING AND TECHNOLOGY

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

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

APPLIED PHYSICS

(Information Technology)

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 (10x1M=10 Marks)

1. a What is meant by dual nature?
   b Define Heisenberg uncertainty principle.
   c Which band determines the electrical conductivity of a solid.
   d What is Fermi level and Fermi Energy
   e Define Hall Effect.
   f State Drift current.
   g On which principle does solar cell works.
   h List the examples of Peizo electric materials.
   i Define Numerical Aperture.
   j In quantum computing, what is the basic unit of information?

Part-B

Answer All the following questions. (5X10M=50Marks)

2 a) Explain Physical significance of wave function. (5m)
b) Calculate the De-Broglie wavelength of an electron which is accelerated by a potential of 100V. h=6.6X10-^{34} Js, m=9.1 X10 -^{31} Kg. (5m)

OR

3 Apply Schrödinger's Wave equation to a particle in Infinite Square well potential and obtain wave function and energy values? (10m)

4 Explain Kronnig- Penney Model with a neat labelled diagram. (10m)

OR

5 a) State and derive effective mass of an electron. (5m)
b) Explain the origin of Energy band in solids. (5m)

6 a) Explain I-V characteristics of PN junction diode. (5m)
b) Distinguish between Intrinsic and Extrinsic semiconductors. (5m)

OR

7 a) State and derive Hall –Effect with applications. (5m)
b) Explain the formation of PN Junction Diode with a neat labelled diagram. (5m)

8 a) Explain the working of LED with a neat labelled diagram. (6m)
b) Write a short note on Peizo Electric materials. (4m)

OR

9 What is Ferro electricity? Explain the Hysteresis curve exhibited by Ferro electric material with a suitable sketch. (10m)

10 a) State and derive the expression for Numerical Aperture and Acceptance Angle. (6m)
b) List the application of optical fibers in different fields. (4m)

OR

11 Define Bloch sphere and represent bloch vectors on X,Y,Z axis.(10m)