



R20 Regulation

Subject Code:3B1AL

TKR COLLEGE OF ENGINEERING AND TECHNOLOGY

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

B.Tech I Semester Supplementary Examinations, September 2023

APPLIED PHYSICS

(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 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

(10x2M=20 Marks)

- 1 Define Relaxation time.
- 2 Define Mean free path
- 3 What are intrinsic and extrinsic semiconductors give two examples of them
- 4 Explain the formation of P-N junction diode
- 5 Which group materials were used for optoelectronic device applications.
- 6 Write a short notes on band gap modification.
- 7 What are direct bandgap and indirect band gap semiconductors?
- 8 Define electroluminescence.
- 9 What is photodetector?
- 10 Mention the types of semiconductor photodetectors.

Part-B

Answer All the following questions.

(5X 10M=50Marks)

- 11 Derive an expression for Density of states in an atom. [10]
OR
- 12 What is the effective mass of electron? Obtain the expression for effective mass of electron. [10]
- 13 Calculate the electronic concentration in Intrinsic semiconductor. [10]
OR
- 14 Define Hall effect? Derive an expression for Hall coefficient of a given semiconductor? [10]
- 15 Explain the optical transitions (emission and absorption) in bulk semiconductors. [10]
OR
- 16 Derive an expression for optical joint density of states. [10]
- 17 Explain in detail LED structure and characteristics. [10]
OR
- 18 Explain the structure and working of semiconductor laser. [10]
- 19 Explain general properties and different types of photo detectors. [10]
OR
- 20 Explain Avalanche photo detector structure and characteristics. [10]

