



R20 Regulation

TKR COLLEGE OF ENGINEERING AND TECHNOLOGY

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

Subject Code: 3B2AF

APPLIED PHYSICS

(Common to EEE,CSE,CSE(AI&ML),CSE(DS) and IT)

Maximum Marks: 70

Date:16.09.2023 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

(10x2M=20 Marks)

- 1 Define relaxation time.
- 2 Define mean free path.
- 3 What is drift and diffusion current?
- 4 List the applications of Hall effect
- 5 Which group materials were used for optoelectronic device applications.
- 6 Write about 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 Explain classical free electron theory of metals. Derive expression for conductivity of a material. [10]
- OR
- 12 What is the effective mass of electron? Obtain the expression for effective mass of electron. [10]
- 13 Calculate the carrier concentration for N -type semiconductor. [10]
- OR
- 14 Derive an expression for carrier concentration of Intrinsic semiconductor for electrons in conduction band. [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 hetro junction semiconductor laser. [10]
- 19 Explain the construction and working of solar cell. [10]
- OR
- 20 Explain Avalanche photo detector structure and characteristics. [10]