



B. Tech I Semester Supplementary Examinations, January 2026

APPLIED PHYSICS
(ECE)

Maximum Marks: 70

Date: 09.01.2026

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) | Marks | CO | BTL |
|---|---|------------------|-------|----|-----|
| 1 | Explain Relaxation time. | | 2M | 1 | L1 |
| 2 | Define Mean free path | | 2M | 1 | L1 |
| 3 | What are intrinsic and extrinsic semiconductors give two examples of them | | 2M | 2 | L1 |
| 4 | List the applications of Hall effect | | 2M | 2 | L1 |
| 5 | Explain photovoltaic effect | | 2M | 3 | L1 |
| 6 | Write a about Optical loss and gain. | | 2M | 3 | L1 |
| 7 | What are the materials used for the construction of LED | | 2M | 4 | L1 |
| 8 | What is quantum wire laser? | | 2M | 4 | L1 |
| 9 | What is photodetector? | | 2M | 5 | L1 |
| 10 | Mention the types of semiconductor photodetectors. | | 2M | 5 | L1 |

Part-B

| Answer All the following questions. | | (5X10M=50Marks) | Marks | CO | BTL |
|-------------------------------------|---|-----------------|-------|----|-----|
| 11 | Derive an expression for Density of states in an atom | | 10M | 1 | L2 |
| OR | | | | | |
| 12 | What is the effective mass of electron ?Obtain the expression for effective mass of electron. | | 10M | 1 | L2 |
| 13 | Calculate the carrier concentration for N -type semiconductor | | 10M | 2 | L2 |
| OR | | | | | |
| 14 | Calculate the carrier concentration forP- type semiconductor. | | 10M | 2 | L2 |
| 15 | Explain about Joint density of states of photons. | | 10M | 3 | L2 |
| OR | | | | | |
| 16 | Explain about different types of Hetero structures. | | 10M | 3 | L2 |
| 17 | Explain in detail LED structure and characteristics. | | 10M | 4 | L2 |
| OR | | | | | |

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|----|---|-----|---|----|
| 18 | Explain the structure and working of hetero junction semiconductor laser. | 10M | 4 | L2 |
| 19 | What is PIN diode? Explain structure and working of PIN diode. | 10M | 5 | L2 |
| | OR | | | |
| 20 | What is solar cell, Explain I-V characteristics of a solar cell. | 10M | 5 | L2 |