



## I B.Tech II Sem Supply End Examination, March 2021

**APPLIED PHYSICS****(EEE, CSE & IT)****Time: 3 Hours.****Max. Marks: 70**

Note: 1. Answer any FIVE questions.

2. Each question carries 14 marks and may have a, b as sub questions.

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|---|----|---|----|-----|----|
| 1 | a) | What are matter waves? Derive an expression for de-Broglie wavelength.  | 7M | C01 | R  |
|   | b) | Describe the Davisson and Germer experiment to demonstrate the wave nature of electrons.  | 7M | C01 | U  |
| 2 | a) | What is Photoelectric effect? What are the essential physical assumptions needed to explain the characteristics of photoelectric effect?              | 7M | C01 | An |
|   | b) | What is Compton effect? Give its physical significance. How does it support the photon nature of light?   | 7M | C01 | U  |
| 3 | a) | What is Hall effect? Derive an expression for Hall coefficient.   | 7M | C02 | R  |
|   | b) | What are drift and diffusion currents in a pn-junction?   | 7M | C02 | U  |
| 4 | a) | Explain the working principle of PIN and avalanche photo detectors. What are the materials used in photo detectors and mention their characteristics? | 7M | C03 | U  |
|   | b) | What are the working steps of a solar cell?   | 7M | C03 | U  |
| 5 | a) | Explain the construction and principle of operation of a Bipolar Junction Transistor.   | 7M | C02 | An |
|   | b) | Explain how a PN diode acts as a Light Emitting Diode? What are the advantages of LEDs?   | 7M | C03 | An |
| 6 | a) | Describe the construction and working of CO <sub>2</sub> laser with its energy level diagram.   | 7M | CO  | Ap |
|   | b) | Write the medical and industrial applications of lasers.  | 7M | CO  | U  |
| 7 | a) | Define acceptance angle and numerical aperture. Deduce the expressions for the numerical aperture and acceptance angle.                               | 7M | C02 | U  |
|   | b) | State the laws of electrostatics and derive equation of continuity.   | 7M | C03 | U  |
| 8 | a) | Explain the classification of magnetic materials.   | 7M | C04 | An |
|   | b) | What are the applications of magnetic materials? Explain Hysteresis.  | 7M | C04 | U  |