A-0597

Total Pages : 3 **Roll No. .....**

MSCPH–551

M.Sc. PHYSICS (MSCPH)

(Optoelectronics)

4th Semester Examination, Session December 2024

Time : 2:00 Hrs. Max. Marks : 70

Note* :–** This paper is of Seventy (70) marks divided into Two (02) Sections 'A' and 'B'. Attempt the questions contained in these Sections according to the detailed instructions given therein. ***Candidates should limit their answers to the questions on the given answer sheet. No additional (B) answer sheet will be issued.

Section–A

Long Answer Type Questions 2×19=38

***Note* :–** Section 'A' contains Five (05) Long-answer type questions of Nineteen (19) marks each. Learners are required to answer any *two* (02) questions only.

1. What are Phototransistors ? Explain the working principle and characteristics of Phototransistors. Also explain Its applications.

2. What is the working principle of optical fiber ? What are the advantages of optical fiber communication ?

3. Discuss working of LED and concept of electro-luminescence. Also discuss characteristics of LED devices.

4. What do you understand by equivalent circuit ? Explain single diode model and double diode model in detail.

5. Write short notes on the following :

   (a) PIN DIODE

   (b) Electron hole pair formation and recombination

   (c) Effect of electric field on absorption

   (d) Responsivity and Quantum Efficiency

Section–B

Short Answer Type Questions 4×8=32

***Note* :–** Section 'B' contains Eight (08) Short-answer type questions of Eight (08) marks each. Learners are required to answer any *four* (04) questions only.

1. What do you understand by energy levels and energy bands ? Explain energy bands in solids.
2. What do you understand by Avalanche photodiode ? Discuss its Advanced Features and Characteristics.
3. Differentiate Laser diode and Junction diode.
4. Explain modulated barrier photodiode in detail.
5. Describe radiation in semiconductors and also explain relation between absorption and emission spectra.
6. With the help of a diagram explain the Electrical characteristic of LED.
7. Discuss temperature effects on photovoltaic devices.
8. What do you understand by heterojunction diodes ? Discuss its applications.

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