

Roll No.
Printed Pages : 2

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BT-7 / M-14

OPTICAL COMMUNICATION

Paper-ECE-405-E

Time allowed : 3 hours [Maximum marks : 100]

Note : Attempt five questions in all, selecting at least one question from each unit.

Unit-I

1. (a) With ray model discuss the propagation of light in an optical fiber? What is the role of numerical aperture in the optical fiber communication system? 10
(b) What is the need of cladding in optical fibers? Distinguish between single mode and multimode fibers. Explain their applications. 10
2. What is the difference between step index and graded index fibers? What is their utility? Explain why graded index fibers are preferred in WAN applications? 10

Unit-II

3. Discuss the various loss mechanisms in optical fibers and suggest ways to minimize them. 20
4. Write a short note on :
(a) Bending and coupling losses in fibers? 10
(b) Wave guide dispersion. 10

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Unit-III

5. (a) Compare the working of LED's and LASER diodes? How are they similar and what are their differences? 10
(b) Discuss the lasing threshold conditions of a semiconductor laser in terms of its geometry and optical gain of the medium. Why carrier confinement is important in semiconductor lasers? 10
6. (a) Compare the performance of P-i-n diodes and avalanche photodiodes as optical detectors in communication systems. 10
(b) Write a short note on :
(i) Coherent vs non-coherent detectors. 5
(ii) Parts of an optical fiber communication system? 5

Unit-IV

7. What do you understand by an optical network? Discuss the topology and features of an optical network. 20
8. What do you understand by an optical amplifier? Discuss its salient features? What is the advantage of using optical amplifier in place of conventional amplifiers in optical communication systems? 20

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