Reg. No. : | | | | | | | | | | | | |

Question Paper Code : 20533

B.E./B.Tech. DEGREE EXAMINATIONS, NOVEMBER/DECEMBER 2023.

Fifth Semester

Computer and Communication Engineering

CEC 345 — OPTICAL COMMUNICATION AND NETWORKS

(Common to Electronics and Communication Engineering and Electronics and Telecommunication Engineering)

(Regulations 2021)

Time : Three hours Maximum : 100 marks

Answer ALL questions.

PART A — (10 × 2 = 20 marks)

1. What is optical fiber communication system?

2. What are the benefits of using step-index fiber?

3. How is silica fiber made?

4. Differentiate dispersion shifted and dispersion flattened fibers.

5. What exactly is the role that population inversion plays?

6. What is LED and its characteristics?

7. How is attenuation measured in fiber optic?

8. How does one determine the amount of optical return loss?

9. What is the difference between ONT and PON?

10. What is a long haul network?

PART B — (5 × 13 = 65 marks)

11. (a) Explain Ray theory transmission in optical fibers with necessary expressions.

Or

(b) Give a detailed illustration of Modes, Mode coupling, Step and Graded index fibers in Cylindrical Fiber.

12. (a) Explain the primary approaches of intermodal and intramodal dispersion in optical fiber.

Or

(b) What are nonlinear scattering losses in optical fiber? Explain.

13. (a) What is P-N Junction? Provide a detailed study on formation of P-N Junction.

Or

(b) LED Structures-Discuss and show its Various Types and application.

14. (a) Discuss the methods to measure the numerical aperture of a fiber.

Or

(b) What method is used for attenuation measurement? Illustrate with example.

15. (a) What are the different types of wavelength division multiplexing? Discuss it in detail.

Or

(b) Provide examples of optical network routing and wavelength assignment.

PART C — (1 × 15 = 15 marks)

16. (a) What is optical Ethernet? How it delivers Ethernet bandwidth ranging up to 400 Gbit/s using optical fiber lines?

Or

(b) Semiconductor-based LEDs and laser diodes generally have two emission configurations. Justify your answer with a case study.

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