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

Question Paper Code : 30543

B.E./B.Tech. DEGREE EXAMINATIONS, NOVEMBER/DECEMBER 2024.

Seventh Semester

Electronics and Communication Engineering

EC 8751 – OPTICAL COMMUNICATION

(Common to : Computer and Communication Engineering)

(Regulations 2017)

Time : Three hours Maximum : 100 marks

Answer ALL questions.

PART A — (10 × 2 = 20 marks)

1. Recall the principle of signal propagation through optical fibres.
2. List the function of the optical cable?
3. Mention the significances of cladding in optical fiber.
4. Define cutoff wavelength of an optical fiber.
5. Recall the formula for optical band gap.
6. Define detector response time.
7. Differentiate BER and sensitivity.
8. Define coupling loss in optical fiber.
9. Mention the functions of a preamplifier.
10. What is splicing in optical fiber and its types?

PART B — (5 × 13 = 65 marks)

11. (a) Briefly explain the basic optical laws. Explain the mode analysis for optical propagation through fibers. (13)

Or

(b) With proper illustrations, explain the transverse electric and magnetic modes in optical fibers. (13)

12. (a) Elucidate on the various transmission characteristics of optical fibers. (13)

Or

(b) Explain the characteristics of single mode fiber and Rd profile. (13)

13. (a) Explain the working principle of LED and LASER diodes. (13)

Or

(b) Summarize the working principle and significance of PIN photo detector and also discuss the temperature effects on the PIN photo detector. (13)

14. (a) Explain the coupling loss measurement in a fiber optic system with neat sketches. (13)

Or

(b) Explain the significance of front end amplifiers and their performance in digital optical receivers. (13)

15. (a) Design a point to point optical communication link and estimate its link budget. (13)

Or

(b) Briefly explain SONET/SDH optical interface and interpret the SONET/SDH ring architecture. (13)

PART C — (1 × 15 = 15 marks)

16. (a) (i) Explain the method of calculating dispersion and mode field diameter in optical fiber. (10)

(ii) Interpret the significance of soliton in optical communication system. (5)

Or

(b) (i) Explain the methodology of dispersion and power measurement. (10)

(ii) Categorize the types of fiber optic connectors and their functionalities. (5)