Reg. No. : ☐☐☐☐☐☐☐☐☐☐☐☐☐

Question Paper Code : 50503

B.E/B.Tech DEGREE EXAMINATIONS, APRIL/MAY 2023.

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. State the laws of optics.

2. List the difference between single mode and multi-mode fiber.

3. What is fundamental mode of waveguide?

4. What is needed to predict the performance characteristics of single mode fibers?

5. What is the wavelength of single mode fiber?

6. Differentiate between intrinsic and extrinsic semiconductor.

7. What is meant by responsivity of detector?

8. Define quantum efficiency.

9. Give the importance of numerical aperture in an optical fiber.

10. What is OADM and why it is used?

PART B — (5 × 13 = 65 marks)

11. (a) Explain the cylindrical optical fiber and its various modes.   (13)

Or

    (b) With neat diagram explain the transverse electric and transverse magnetic modes.   (13)

12. (a) Discuss the various losses in an optical fiber with relevant diagram. (13)

Or

(b) Explain the characteristics of single mode fiber. Explain the RI profile and calculation of mode field diameter. (13)

13. (a) Which modulation technique is used by laser? Discuss LEDs in detail. (13)

Or

(b) Explain the working of PIN diode detector and avalanche photo diodes. (13)

14. (a) With suitable diagram explain the operation of an optical receiver. (13)

Or

(b) Explain splicing and its types with illustrations. (13)

15. (a) Explain Wavelength Division Multiplexing. What are the two types of WDM. Also list the difference between WDM and SONET? (13)

Or

(b) List and explain the types of solitons. Elaborate spatial solitan with necessary diagrams. (13)

PART C — (1 × 15 = 15 marks)

16. (a) (i) Explain any one fiber fabrication process with neat diagram. Compare the different methods of fabrication. (7)

(ii) With neat diagram explain the transverse electric and transverse magnetic modes? (8)

Or

(b) Explain the features of SONET. With appropriate diagram explain the architecture and SONET/SDH Transmission Process. (15)