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

Question Paper Code : 11282

B.E./B.Tech. DEGREE EXAMINATION, MAY/JUNE 2014.

Seventh Semester

Electronics and Communication Engineering

080290058 – OPTICAL FIBER COMMUNICATION

(Regulation 2008)

Time : Three hours Maximum : 100 marks

Answer ALL questions.

PART A — (10 × 2 = 20 marks)

1. State the optical laws to confine light wave within the fiber.

2. Draw the index profiles of SIF and GIF.

3. Define group velocity dispersion.

4. What is meant by mode coupling?

5. Compare the characteristics of LED and Laser diode.

6. Write the water marking technique.

7. Identify the receiver error sources.

8. What is meant by black current?

9. Give the significance of solitons.

10. Identify the operational principles of WDM.

PART B — (5 × 16 = 80 marks)

11. (a) With a neat sketch, explain the modes and configurations of optical fiber.

Or

(b) With a neat diagram, explain the mode theory of circular waveguides.

12. (a) Analyze the changes in the pulse spread due to the dispersion in single mode fiber and multimode fiber with neat sketch.

Or

(b) (i) Consider a continuous 12Km long optical fiber link, which has a loss of 1.5 dB/Km. What is the minimum optical power level that must be launched into fiber to maintain the power level of .3 μm at the receiving end? What is the required input power if the fiber has a loss of 2.5 dB/Km? (8)

(ii) Describe about the fiber losses. (8)

13. (a) Discuss the principle of operation of Fabry - perot and distributed feedback lasers.

Or

(b) With diagram, explain the power launching and coupling techniques.

14. (a) With diagram, explain the operation of Avalanche photodiode.

Or

(b) With diagram, explain the receiver operation and its probability of error.

15. (a) Calculate the power budget for passive optical network architecture and determine the number of optical network units that can be supported by assuming the following parameters: Laser output power of –3 dBm, LED output power of –20 dBm, transmit bit rate of 155Mbps, receiver sensitivity of –40 dBm, fiber loss of 10dB, 1 × 8 wavelength router loss 5 dB, 1 × 32 wavelength router loss of 9dB, 1 × 64 wavelength router loss of 12dB and excess splitter loss of 1 dB.

Or

(b) (i) Discuss the noise effects on system performance. (8)

(ii) Describe the concepts of SONET/SDH. (8)
