C

Reg. No. : ☐☐☐☐☐☐☐☐☐☐☐☐

Question Paper Code: 57402

B.E. / B.Tech. DEGREE EXAMINATION, MAY 2022

Seventh Semester

Electronics and Communication Engineering

15UEC702 - OPTICAL COMMUNICATION AND NETWORKS

(Regulation 2015)

Duration: Three hours   Maximum: 100 Marks

Answer ALL Questions

PART A - (5 x 1 = 5 Marks)

1. In an optical fiber the concept of numerical aperture is applicable in   CO1- R
    describing the ability of _____.

    (a) Light dispersion   (b) Light Polarization   (c) Light Collection   (d) Light Scattering

2. What is the typical value of refractive index of air?   CO2- R

    (a) 1.5   (b) 1.0   (c) 2.3   (d) 2.0

3. What is the light amplification process used for the laser beam formation?   CO3- R

    (a) Spontaneous emission   (b) Stimulated emission

    (c) Both a and b   (d) None of the above

4. Which component of an optical receiver is a linear frequency shaping filter used   CO4- R
    for the compensation of signal distortion and Inter Symbol Interference (ISI)?

    (a) Photo Detector   (b) Amplifier   (c) Equalizer   (d) None of the above

5. Which of the following is not related to Kerr effects?   CO5- R

    (a) Self-Phase modulation   (b) Cross-phase modulation

    (c) Four wave mixing   (d) Stimulated Raman Scattering

PART – B (5 x 3= 15 Marks)

6. What are step index and graded index fibers?   CO1 R

7. What is Rayleigh scattering?   CO2 R

8. Differentiate LEDs and Laserdiodes.   CO3 R

9. What is intersymbol interference (ISI)?   CO4 R

10. What is SONET?   CO5 R

PART – C (5 x 16= 80Marks)

11. (a) Discuss the mode theory of circular waveguides.   CO1- U   (16)

Or

    (b) Explain ray optics in detail.   CO1- U   (16)

12. (a) Describe in detail about the signal distortion in optical waveguide.   CO2- U   (16)

Or

    (b) Analyze the two types of connectors with suitable diagrams.   CO2- U   (16)

13. (a) Write a detailed note on the Laser diode modes.   CO3- U   (16)

Or

    (b) Write in detail about avalanche photodiodes and explain briefly about photo detector noise and SNR.   CO3- U   (16)

14. (a) Explain the error sources of fundamental receiver operations.   CO4- Ana   (16)

Or

    (b) Analyze the fiber numerical aperture measurements with suitable set up.   CO4- Ana   (16)

15. (a) Discuss the operational principles of WDM and its key features.   CO5- U   (16)

Or

    (b) Explain in detail about SONET/SDH optical networks.   CO5- U   (16)

57402