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Question Paper Code: 57402

B.E. / B.Tech. DEGREE EXAMINATION, NOV 2018

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)

- Which law gives the relationship between refractive index of the dielectric? CO1- R
(a) Law of reflection (b) Snell's law (c) Millman's Law (d) Huygen's law
- Dispersion is used to describe the CO2- R
(a) Splitting of white light into its component colors.
(b) Propagation of light in straight lines.
(c) Bending of a beam of light when it goes from one medium to another.
(d) Bending of a beam of light when it strikes a mirror
- The amount of radiance in planar type of LED structure. CO3- R
(a) Low (b) High (c) Zero (d) Negligible
- A technique used for determining the total fiber attenuation per unit length is CO4- R
(a) Frank (b) Cut-off (c) cut-back (d) Erlangen
- SONET/SDH is a synchronous network using synchronous CO5- R
(a) TDM multiplexing (b) CDMA multiplexing
(c) TDM demultiplexing (d) CDMA demultiplexing

PART – B (5 x 3= 15 Marks)

- A silica optical fiber with a core diameter large enough to be considered by ray theory analysis has core refractive index of 1.50 and a cladding refractive index of 1.47. Determine the critical angle. CO1-App
- Distinguish between dispersion shifted and dispersion flattened fibers. CO2- R

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| 8. | What is meant by heterojunction? List out the advantages of heterojunction. | CO3- R |
| 9. | What is the technique used for measuring the total fiber attenuation? | CO4- R |
| 10. | What are the advantages of using soliton signals through fiber? | CO5- R |

PART – C (5 x 16= 80 Marks)

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| 11. | (a) Explain ray optics in detail. | CO1-U | (16) |
| | Or | | |
| | (b) What is numerical aperture of an optical fiber? Deduce an expression for the same. | CO1-U | (16) |
| 12. | (a) What are the basic attenuation mechanisms in the optical fiber communication? Explain in brief on what factors this mechanism depends? | CO2-U | (16) |
| | Or | | |
| | (b) Explain the following | CO2-U | (16) |
| | (i) Mode field diameter | | |
| | (ii) Modal Birefringence | | |
| 13. | (a) Explain the structure and operation of injection laser diode. | CO3-U | (16) |
| | Or | | |
| | (b) Explain in detail about Avalanche photo diode. | CO3-U | (16) |
| 14. | (a) Explain in detail about the fiber optic receiver operation. | CO4-U | (16) |
| | Or | | |
| | (b) Explain in detail about fiber dispersion measurement. | CO4- U | (16) |
| 15. | (a) Write short notes on wavelength routed networks. | CO5- U | (16) |
| | Or | | |
| | (b) Describe in detail about solitons. | CO5- U | (16) |