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

Question Paper Code: 31742

B.E. / B.Tech. DEGREE EXAMINATION, NOV 2016

Seventh Semester

Electronics and Communication Engineering

01UEC702 - OPTICAL COMMUNICATION AND NETWORKS

(Regulation 2013)

Duration: Three hours Maximum: 100 Marks

Answer ALL Questions

PART A - (10 x 2 = 20 Marks)

1. What is total internal reflection?
2. Define phase and group velocity.
3. What do you mean by polarization dispersion in a fiber?
4. A fiber has an attenuation of 0.5*db/km* at 1500*nm*. If 0.5*mW* of power is initially launched into the fiber, what is the power level in after 25*km*?
5. What is meant by hetero junction structure?
6. Define internal quantum efficiency of LED and LASER.
7. Draw and describe the operation of fiber optic receiver.
8. Mention few fiber diameter measurement techniques.
9. What is optical CDMA?
10. Distinguish SONET and SDH.

PART - B (5 x 16 = 80 Marks)

11. (a) (i) With diagram, explain acceptance angle and numerical aperture of fibers. (8)

(ii) Classify fibers and explain them. (8)

Or

(b) (i) Explain the features of multimode and single mode step index fiber and compose them. (8)

(ii) A single mode step index fiber has a core diameter of 7 *micro meter* and a core refractive index of 1.49. Estimate the shortest wavelength of light which allows single mode operation when the relative refractive index difference for the fiber is 1*%*. (8)

12. (a) With necessary diagrams, explain the cause and types of fiber attenuation loss. (16)

Or

(b) (i) Describe the three types of fiber misalignment that contribute to insertion loss at an optical fiber joint. (8)

(ii) Describe about fiber connectors, splicer and couplers. (8)

13. (a) (i) Describe the operation of a injection laser. (8)

(ii) Compare the optical sources LED and ILD. (8)

Or

(b) (i) What are the possible noise sources that contribute the photo detector noise? (8)

(ii) What is meant by detector response time? Explain the same in detail. (8)

14. (a) Derive the probability of fiber optic receiver. (16)

Or

(b) Explain how attenuation and dispersion measurement could be done. (16)

15. (a) Explain in detail SONET layers and frame structure with diagram. (16)

Or

(b) Discuss the following:

(i) WDM networks (8)

(ii) Ultra high capacity networks (8)

———————