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Question Paper Code: 37402

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

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 the maximum core diameter for a fiber if it is to operate at single mode at a wavelength of 1550nm if the N.A is 0.12?
2. Why do we prefer step index single mode fiber for long distance communication?
3. What do you mean by polarization dispersion in a fiber?
4. Draw the schematic representation of expanded beam connectors.
5. What is meant by hetero junction structure?
6. Define responsivity of a photodiode.
7. Define quantum limit.
8. State the significance of maintaining the fiber outer diameter constant.
9. What is optical CDMA?
10. Illustrate inter-channel cross talk that occurs in a WDM system.

PART - B (5 x 16 = 80 Marks)

11. (a) (i) Explain with neat diagram the elements of an optical fiber transmission link. (10)

(ii) List the advantages of optical communication. (6)

Or

(b) With diagram, explain acceptance angle and numerical aperture of fibers. (16)

12. (a) Discuss in detail about material and waveguide dispersion. (16)

Or

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

13. (a) What are the possible noise sources that contribute the photo detector noise. (16)

Or

(b) Explain in detail about construction and working principle of PIN Photodiode. (16)

14. (a) Explain the fundamental receiver operation in optical communication link. (16)

Or

(b) Derive the probability of fiber optic receiver. (16)

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

Or

(b) (i) What is broadcast-and-select multi hop network? Explain. (8)

(ii) Write a detailed note on optical CDMA and its applications. (8)