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**Question Paper Code: 37402**

B.E. / B.Tech. DEGREE EXAMINATION, AUGUST 2021

Seventh Semester

Electronics and Communication Engineering

01UEC702 - OPTICAL COMMUNICATION AND NETWORKS

(Regulation 2013)

Duration: 1:45 hour

Maximum: 50 Marks

PART A - (10 x 2 = 20 Marks)

**(Answer any ten of the following questions)**

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 solitons?
10. What is optical CDMA?
11. A silica fiber with a core diameter large enough to be considered by ray theory analysis has a core refractive index of 1.50 and a cladding refractive index of 1.47. Determine critical angle at the core-cladding interface and Numerical Aperture.
12. What is the total internal reflection in the fiber?

13. Differentiate stimulated Brillouin and stimulated Raman scattering.
14. When the mean optical power launched into an 8Km length of fiber is  $120\mu\text{W}$ , the mean optical power at the fiber output is  $3\mu\text{W}$ . Determine the signal attenuation per kilometer for the fiber.
15. Define internal quantum efficiency of a LED.

PART – B (3 x 10= 30 Marks)

**(Answer any three of the following questions)**

16. Explain acceptance angle and Numerical Aperture of fibers. (10)
17. Explain the causes and types of fiber attenuation loss with necessary diagrams. (10)
18. What are the possible noise sources that contribute the photo detector noise. (10)
19. Explain the fundamental receiver operation in optical communication link. (10)
20. Explain in detail SONET layers and frame structure with diagram. (10)