

Reg. No. :

--	--	--	--	--	--	--	--	--	--	--

Question Paper Code: 47402

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

Seventh Semester

Electronics and Communication Engineering

14UEC702-OPTICAL COMMUNICATION AND NETWORKS

(Regulation 2014)

Duration: 1:45 hour

Maximum: 50 Marks

PART A - (10 x 2 = 20 Marks)

(Answer any ten of the following questions)

1. A silicon optical fiber with a core diameter large enough to be considered by ray theory analysis has a core refractive index of 1.50 and cladding refractive index of 1.47. Find the critical angle of the core-cladding interface.
2. What is meant by ISI?
3. Define quantum efficiency.
4. What are the methods used to measure the fiber refractive index profile?
5. What is optical CDMA?
6. What is the necessity of cladding in optical fiber cable
7. What is meant by ISI?
8. What is meant by hetero junction structure?
9. What are the methods used to measure the fiber refractive index profile?
10. What is optical CDMA?
11. A silicon optical fiber with a core diameter large enough to be considered by ray theory analysis has a core refractive index of 1.50 and cladding refractive index of 1.47. Find the critical angle of the core-cladding interface.

12. What is meant by ISI?
13. Define quantum efficiency.
14. What are the methods used to measure the fiber refractive index profile?
15. Define the term soliton.

PART – B (3 x 10= 30 Marks)

(Answer any three of the following questions)

16. A silica optical 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 a) the critical angle at the core –cladding interface b) the numerical aperture of the fiber c) the acceptance angle in air for the fiber. (10)
17. 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 (10)
 - (a) The overall signal attenuation or loss in decibels through the fiber assuming there are no common connectors or splices
 - (b) The signal attenuation per kilometer for the fiber
 - (c) The overall signal attenuation for a 10km optical link using the same fiber with splices at 1km intervals each giving attenuation of 1dB
 - (d) The numerical aperture input/output power ratio
18. Explain the structure of surface emitting and edge emitting LEDs. (10)
19. What is the role of preamplifier in optical receiver? Explain the different types of preamplifiers. (10)
20. Explain in detail about the wavelength routed networks. (10)

