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Question Paper Code: 47402

B.E. / B.Tech. DEGREE EXAMINATION, APRIL 2019

Seventh Semester

Electronics and Communication Engineering

14UEC702-OPTICAL COMMUNICATION AND NETWORKS

(Regulation 2014)

Duration: Three hours

Maximum: 100 Marks

Answer ALL Questions

PART A - (10 x 1 = 10 Marks)

- Which is an advantage of optical communication links over using transmission lines or waveguides?
 - Extremely wide bandwidths
 - Immunity to electromagnetic interference
 - Lower cost
 - All the above
- The cutoff normalized frequency of single mode fiber is
 - $V_C = 2.504$
 - $V_C = 2.045$
 - $V_C = 2.450$
 - $V_C = 2.405$
- Scattering loss occurs due to
 - Microscopic variations
 - Compositional fluctuations
 - Semi-permanent joint
 - All of the above
- The electric field orientation of a light signal is referred to as
 - Penetration
 - absorption
 - polarization
 - All of the above

5. Single mode laser sources are used for
- (a) Short distance communication (b) Medium distance communication
(c) Long distance communication (d) All of the above
6. RAPD is
- (a) Rise through avalanche photo diode (b) Repeat through avalanche photo diode
(c) Reach through avalanche photo diode (d) Reduce through avalanche photo diode
7. The advantages of preamplifier is
- (a) Low bandwidth (b) High bandwidth (c) Low gain (d) Low dynamic range
8. A common method for determining the total fiber attenuation per unit length is
- (a) Interferometric method (b) Cut-back method
(c) Time domain method (d) Frequency domain method
9. The transfer of information from source to destination through a series of intermediate nodes is
- (a) Topology (b) Routing (c) Switching (d) Network
10. The non linearity of a propagating signal in carrier induced phase modulation is called
- (a) Kerr effect (b) chirp effect
(c) Optical loss (d) cross phase effect

PART - B (5 x 2 = 10 Marks)

11. What is the necessity of cladding in optical fiber cable
12. What is meant by ISI?
13. What is meant by hetero junction structure?
14. What are the methods used to measure the fiber refractive index profile?
15. What is optical CDMA?

PART - C (5 x 16 = 80 Marks)

- 16 (a) With diagram, explain the acceptance angle and numerical aperture of fibres and Classify them. (16)
- Or
- (b) Draw and explain the elements of optical communication systems? (16)
- 17 (a) Calculate the number of modes supported by a graded index fiber having a core radius of 25 μm and operating at 820nm. The fiber has a refractive index of 1.48 at the core axis and a cladding index of 1.46. Assume a parabolic index profile (16)
- Or
- (b) Describe about fiber connectors, splices, and couplers (16)
- .
- 18 (a) Draw and compare LED and Injection Laser diode structures. (16)
- Or
- (b) Discuss about the probability of error of fiber optic receiver. (16)
- .
- 19 (a) What is the role of preamplifier in optical receiver? Explain the different types of Pre amplifiers. (16)
- Or
- (b) Explain how attenuation and dispersion measurements could be done (16)
- 20 (a) Explain SONET layers and frame structure with neat diagram (16)
- Or
- (b) Discuss the performance improvement of WDM and EDFA systems (16)

