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

Question Paper Code: 47402

B.E. / B.Tech. DEGREE EXAMINATION, DEC 2020

Seventh Semester

Electronics and Communication Engineering

14UEC702-OPTICAL COMMUNICATION AND NETWORKS

(Regulation 2014)

Duration: 1.15 hrs Maximum: 30 Marks

PART A - (6 x 1 = 6 Marks)

(Answer any six of the following questions)

1. Snell's law is

(a) $n_1 \sin\varphi_1 = n_2 \sin\varphi_2$ (b) $n_1 \cos\varphi_1 = n_2 \cos\varphi_2$

(c) $n_1 \tan\varphi_1 = n_2 \tan\varphi_2$ (d) $n_1 \cot\varphi_1 = n_2 \cot\varphi_2$

2. The cutoff normalized frequency of single mode fiber is

(a) $V_C = 2.504$ (b) $V_C = 2.045$

(c) $V_C = 2.450$ (d) $V_C = 2.405$

3. Scattering loss occurs due to

(a) Microscopic variations (b) Compositional fluctuations

(c) Semi-permanent joint (d) All of the above

4. Fiber splicing is a type of

(a) Temporary joint (b) Permanent joint

(c) Semi-permanent joint (d) None 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 (3 x 8= 24 Marks)

(Answer any three of the following questions)

11. 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. (8)

12. When the mean optical power launched into an 8km length of fiber is 120μW,the mean optical power at the fiber output is 3μW.Determine (8)

(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

13. Explain the structure of surface emitting and edge emitting LEDs. (8)

14. What is the role of preamplifier in optical receiver? Explain the different types of preamplifiers. (8)

15. Explain in detail about the wavelength routed networks. (8)