Chapter 25: Fiber-Optic Systems

MULTIPLE CHOICE

1. FDDI stands for:
   a. Fiber Digital Data Interface
   b. Fiber Distributed Data Interface
   c. Fiber Distribution Delay Interface
   d. Frequency-Division Data Interface
   ANS: B

2. FITL stands for:
   a. Fiber In The Loop
   b. Fiber Input Timing Loss
   c. Frequency Input to The Loop
   d. Fiber Input Timing Loop
   ANS: A

3. FTTC stands for:
   a. Fiber Transmission Timing Constraint
   b. Fiber Transmission Technology Committee
   c. Fiber Telephone Transmission Cable
   d. Fiber To The Curb
   ANS: D

4. SONET stands for:
   a. Simple Optical Network
   b. Standard Optical Network
   c. Synchronous Optical Network
   d. none of the above
   ANS: C

5. DWDM stands for:
   a. Digital Wavelength-Division Modulation
   b. Dense Wavelength-Division Modulation
   c. Double Wavelength-Division Modulation
   d. Dense Wavelength-Division Multiplexing
   ANS: D

6. A Soliton is a:
   a. defect in the glass
   b. type of particle
   c. type of pulse
   d. type of optical network
   ANS: C

7. Adding bits to synchronize one digital signal to another is called:
   a. bit stuffing
   b. bit-synch
   c. SDH
   d. WDM
   ANS: A

8. Power above the minimum required by an optical receiver is called:
   a. gain margin
   b. excess gain

   ANS: A
9. Typically, repeaters are not required for fiber-optic cable lengths up to:
   a. 1000 miles  
   b. 100 miles
   c. 100 km  
   d. 10 km

   ANS: C

10. In SONET, OC-1 stands for:
    a. Optical Carrier level one  
    b. Optical Coupler unidirectional
    c. Optical Channel one  
    d. Optical Cable type 1

    ANS: A

11. In SONET, STS stands for:
    a. Synchronous Transport Signal  
    b. Synchronous Transport System
    c. Synchronous Transmission Signal  
    d. Synchronous Transmission System

    ANS: A

12. A commonly used fiber-based system for LANs is:
    a. FDDI  
    b. high-speed Ethernet
    c. gigabit Ethernet  
    d. all of the above

    ANS: D

13. The use of solitons on fiber-optic cables is:
    a. common  
    b. experimental
    c. obsolete  
    d. not possible

    ANS: B

14. OTDR stands for:
    a. Optical Time-Delay Response  
    b. Optical Timing Delay Requirement
    c. Optical Time-Domain Reflectometer  
    d. Optical Time-Division Relay

    ANS: C

15. Using fiber-optic cable in a telephone system except for the connection to the subscriber's phone is called:
    a. FDDI  
    b. FTTC
    c. FITL  
    d. SONET

    ANS: B

COMPLETION

1. FTTC stands for Fiber To The ________________.

   ANS: Curb

2. FITL stands for Fiber In The ________________.
3. SDH stands for Synchronous Data _________________.
   ANS: Hierarchy

4. WDM stands for ________________-division multiplexing.
   ANS: Wavelength

5. SONET stands for ________________ Optical Network.
   ANS: Synchronous

6. FDDI stands for Fiber ________________ Data Interface.
   ANS: Distributed

7. Optical amplifiers use ________________-doped glass.
   ANS: erbium

8. Optical amplifiers use a ________________ laser.
   ANS: pump

9. Dense ________________ allows many different wavelengths of light to share a cable.
   ANS: WDM

10. The OC-1 line rate is ________________ Mbps.
    ANS: 51.84

11. SONET does not use bit ________________ to synchronize two digital signals.
    ANS: stuffing

12. SONET uses a ________________ to denote the starting position of an information frame.
    ANS: pointer

13. FDDI systems use two ________________ rings to carry signals.
    ANS: token

14. The two rings of an FDDI system carry data in ________________ directions.
    ANS: opposite
15. Each ________________ in an FDDI system acts as a regenerative repeater.
   ANS: node

16. FDDI uses ________________ mode cables.
   ANS: multi

17. The data rate of an FDDI system is ________________ bps.
   ANS: 100 M

18. SONET frames have considerably more ________________ than do DS frames for information about signal routing and setup.
   ANS: overhead

19. The number of bytes in a SONET frame is ________________.
   ANS: 810

20. The number of bytes in the payload of a SONET frame is ________________.
    ANS: 774

21. The number of rows in a SONET frame is ________________.
    ANS: 9

22. The total number of overhead bytes in a SONET frame row is ________________.
    ANS: 4

23. The number of path overhead bytes in a SONET frame row is ________________.
    ANS: 1

24. SONET frame rows contain path overhead and ________________ overhead.
    ANS: transport

25. In SONET, SPE stands for synchronous payload ________________.
    ANS: envelope

**SHORT ANSWER**

1. What is the bandwidth of a first-order LPF with a rise time of 350 nanoseconds?
   ANS:
1 MHz

2. Calculate the total rise time for a fiber-optic system if the transmitter, receiver, and cable each have a rise time of 50 nanoseconds.

ANS:
86.6 nanoseconds