CHAPTER 9

High-Speed Digital Access: DSL, Cable Modems, and SONET

Review Questions

1. DSL technology and cable modems.
3. The main users of ADSL technology are residential users.
5. ADSL uses DMT.
7. A DSLAM functions like an ADSL modem, but at the telephone company site. A DSLAM also packetizes the data.
9. The head end receives video signals from broadcasting stations and feeds the signals into coaxial cables.
11. The upstream data band uses lower frequencies that are more susceptible to noise and interference. QAM is not a suitable technique for this reason.
13. DOCSIS is a standard for data transmission over an HFC network.
15. STSs are the hierarchy of signals defined by the SONET standards. OCs are the services available to the user.
17. A single clock handles the timing of transmission and equipment across the entire network. This network wide synchronization adds a level of predictability to the system.
19. An STS-1 frame contains 6480 bits (810 octets) and is organized in a matrix of nine rows with 90 octets in each row.
21. Lower rate STSs can be multiplexed to make them compatible with higher rate systems.

Multiple-Choice Questions

23. c
25. c
27. d
29. d
31. c

33. b
35. d
37. a
39. b
41. d
43. c

Exercises

45. To create an STS-36, four STS-9 can multiplexed. There is no more overhead involved.
47. Duration of frame in STS-3: 41.7 ms
    Duration of frame in STS-9: 13.8 ms
    Duration of frame in STS-12: 10.4 ms
    Duration of frame in STS-18: 6.9 ms
    Duration of frame in STS-24: 5.2 ms
    Duration of frame in STS-36: 3.5 ms
    Duration of frame in STS-48: 2.6 ms
    Duration of frame in STS-96: 1.3 ms
    Duration of frame in STS-192: 0.65 ms
49. 22 VT2s in STS-1 frame
51. 7 VT6 in STS-1 frame
53. Combination of one VT6 and one VT1.5 for 8.64 Mbps
55. VT1.5
57. 6.4 Mbps is needed, VT6 would be suitable