
CHAPTER 13

Multiple Access

Review Questions

1. Only one station can send data at a time. Therefore there is no possibility of collision.
3. Backoff in an ALOHA network is incremented when no ACK is received.
5. A jam signal is sent to inform other stations that a collision has occurred.
7. Reservation, polling, and token passing are three popular controlled-access methods.
9. Polling is a procedure in which the primary station asks a secondary station if it has data to send. Selecting is a procedure in which the primary station asks a secondary to prepare to receive data.
11. FDMA, TDMA, and CDMA are the three channelization protocols.
13. CDMA is superior to FDMA because the bandwidth is not divided into channels. CDMA is superior to TDMA because the channel is not divided into time slots.
15. Multiply two sequences, element by element, and add the results.

Multiple-Choice Questions

17. c
19. d
21. a
23. a
25. d
27. b
29. b
31. c
33. a

Exercises

35. In the ALOHA protocol, the station accesses the medium whenever it has data to send.
37. In the ALOHA protocol, an ACK from the receiver means a successful transmission.
39. In the CSMA/CD protocol, a station listens to the line and sends data if the line is detected as idle.
41. In the CSMA/CD protocol, an ACK from the receiver means a successful transmission.
43. In the CSMA/CA protocol, the station listens for an idle line. If the line is idle, the station waits an IFG amount of time and then waits a random amount of time. Data is then sent.
45. In the CSMA/CA protocol, an ACK from the receiver before the timer expires means a successful transmission.
47. In a token-passing protocol, a station accesses the medium if it is in possession of the token.
49. In a token-passing protocol, the receiver does not send an explicit ACK to the sender. However, the frame is returned to the sender. The sender checks a specific bit on the returned frame as a sign of a successful transmission.
51. See Table 13.1.

Table 13.1 Exercise 51

<i>Characteristic</i>	<i>ALOHA</i>	<i>CSMA/CD</i>	<i>CSMA/CA</i>	<i>Token Passing</i>	<i>Channel-ization</i>
Multiple Access	yes	yes	yes	no	yes
Carrier Sense	no	yes	yes	no	no
Collision Checking	no	yes	no	no	no
Acknowledgement	yes	no	yes	no	NA

53. The inner product of the last row by itself.
 $1+1+1+1+1+1+1+1+1+1+1+1+1+1 = 16$

The inner product of the last row by the next to last row.
 $1 -1 +1 -1 +1 -1 +1 -1 +1 -1 +1 -1 +1 -1 = 0$

55. +3, -1, -1, -1