CHAPTER 3

Data Transmission

Multiple-Choice Questions

1. c
3. a
5. c
7. b
9. d
11. d
13. b
15. b
17. c
19. b
21. a
23. a
25. c
27. d

Exercises

29.

a. 4.17×10^{-2} s, 41.7 ms, 4.17×10^{4} µs, 4.17×10^{7} ns, 4.17×10^{10} ps

b. 1.25×10^{-7} s, 1.25×10^{-4} ms, 0.125 µs, 1.25×10^{2} ns, 1.25×10^{5} ps

c. 7.14×10^{-6} s, 7.14×10^{-3} ms, 7.14 µs, 7.14×10^{3} ns, 7.14×10^{6} ps

d. 8.33×10^{-14} s, 8.33×10^{-11} ms, 8.33×10^{-8} µs, 8.33×10^{-5} ns, 8.33×10^{-2} ps

31.

a. 90 degrees

b. 0 degrees

c. 90 degrees

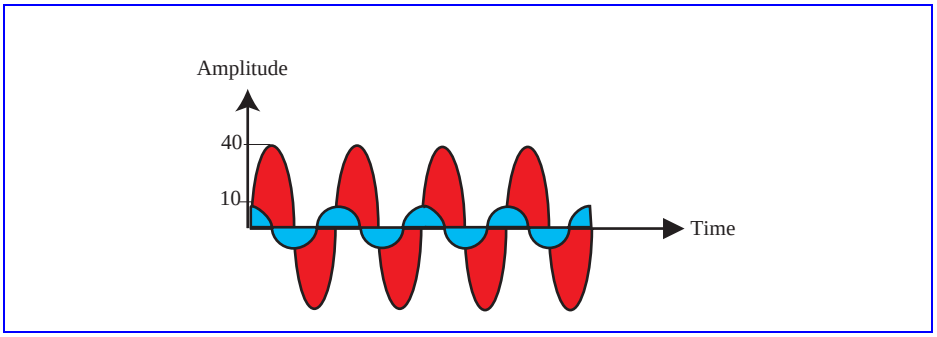
d. 180 degrees

33.

a. 1/8 cycle
b. 1/4 cycle
c. 1/6 cycle
d. 1 cycle

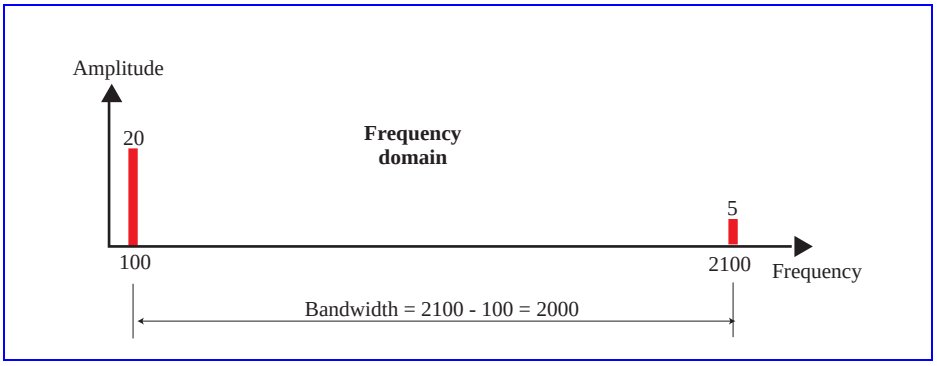
35. See Figure 3.1.

Figure 3.1 *Exercise 35*



37. See Figure 3.2

Figure 3.2 *Exercise 37*



39. See Figure 3.3

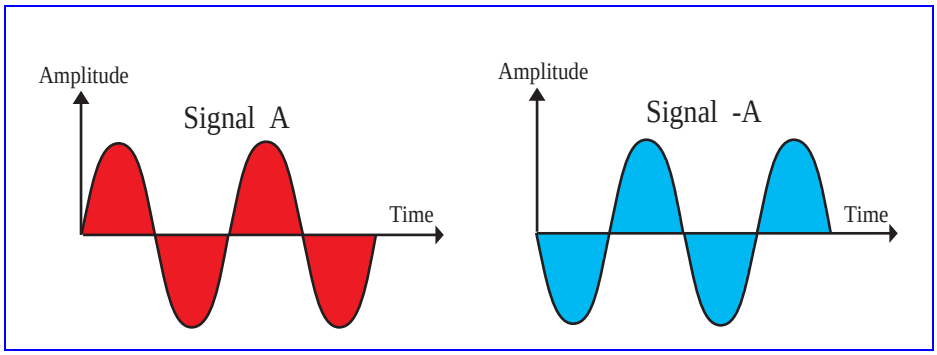
41.

a. 1 Kbps
b. 500 bps
c. 500 Kbps
d. 4 Tbps (4×10^{12} bps)

43.

a. 0.01 s

Figure 3.3 *Exercise 39*



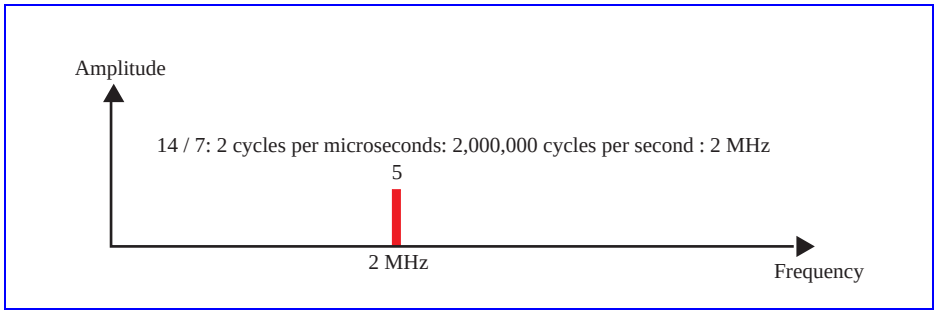
b. 8 ms

c. 800 s

45. 2 MHz

47. 2 MHz. See Figure 3.4.

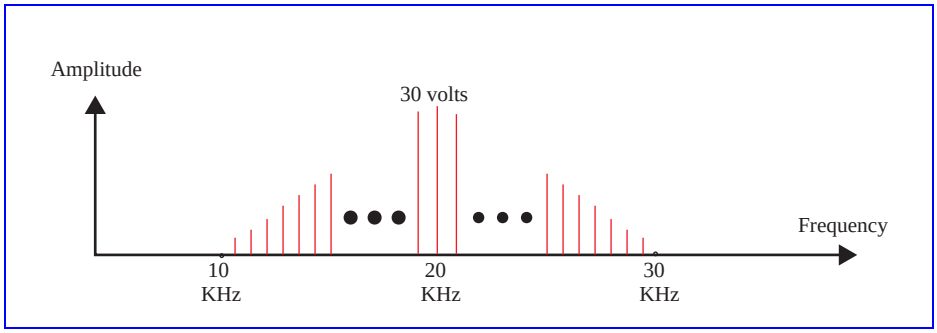
Figure 3.4 *Exercise 47*



49. 0 Hz

51. See Figure 3.5

Figure 3.5 *Exercise 51*

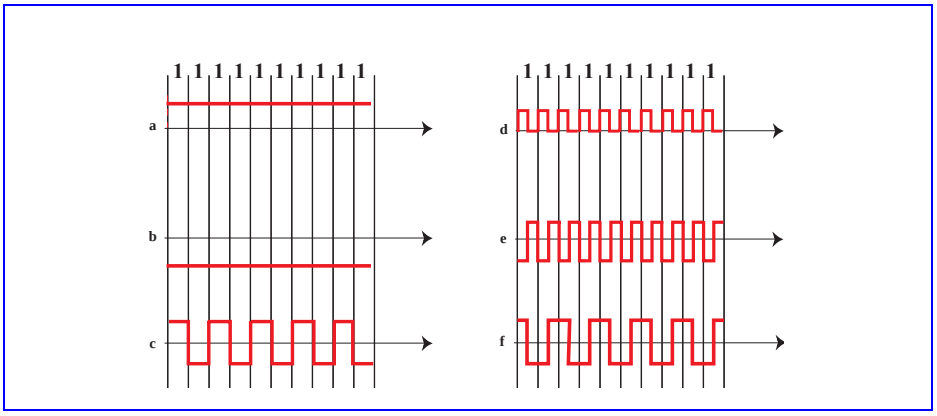


53.

a. 5 s: 5000 bits
b. 1/5 s: 200bits
c. 100 ms: 100 bits

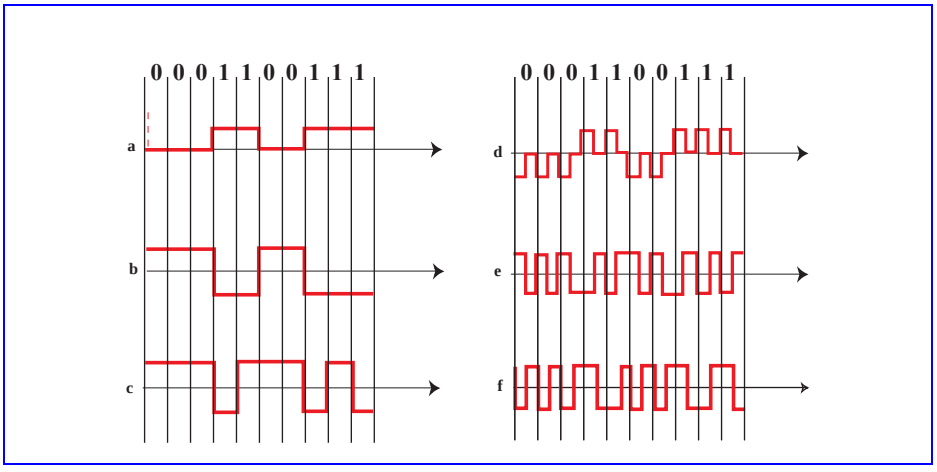
55. See Figure 3.6

Figure 3.6 *Exercise 55*



57. See Figure 3.7.

Figure 3.7 *Exercise 57*



59. 11001001
61. 01110011
63. 8,000 samples per second
65. 1/8000 = 0.125 ms
67. Two bits per sample: bit rate = 8,000 × 2 = 16,000.
69.

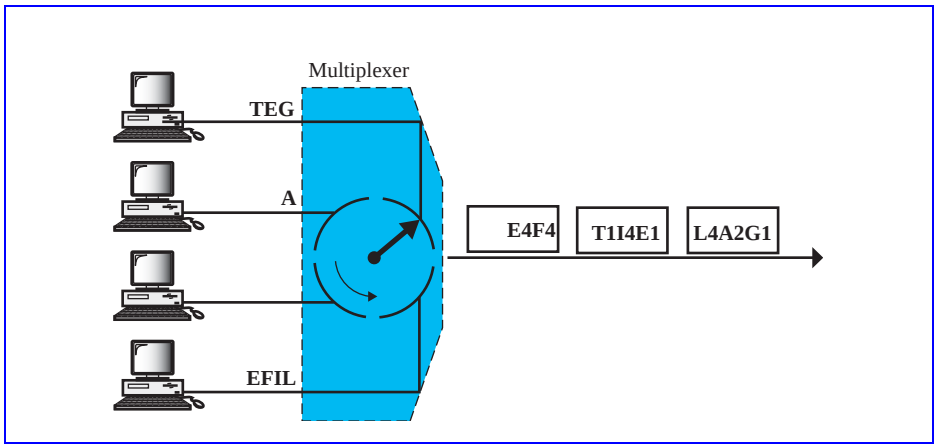
a. 1000 baud
b. 2000 baud
c. 1500 baud
d. 6000 baud

71. FDM: n is frequency of signal; TDM: n is time (s)

73. Number of slots is derived by statistical method (analysis) of the number of input lines that are likely to be transferring at any given time.

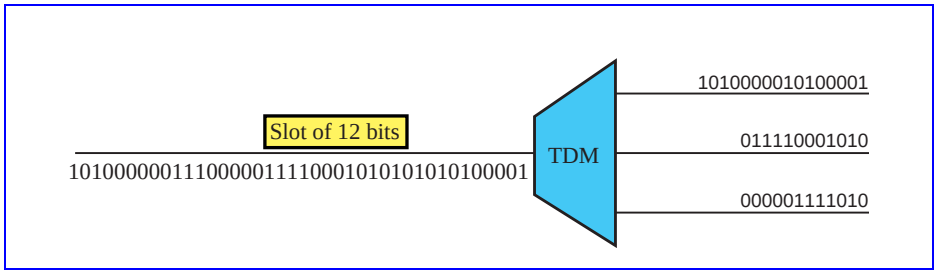
75. See Figure 3.8.

Figure 3.8 *Exercise 75*



77. See Figure 3.9. The output bit rate for each line is 3 Mbps.

Figure 3.9 *Exercise 77*



79. Data rate of each line: 40 Kbps; number of stations sending at full capacity: 8