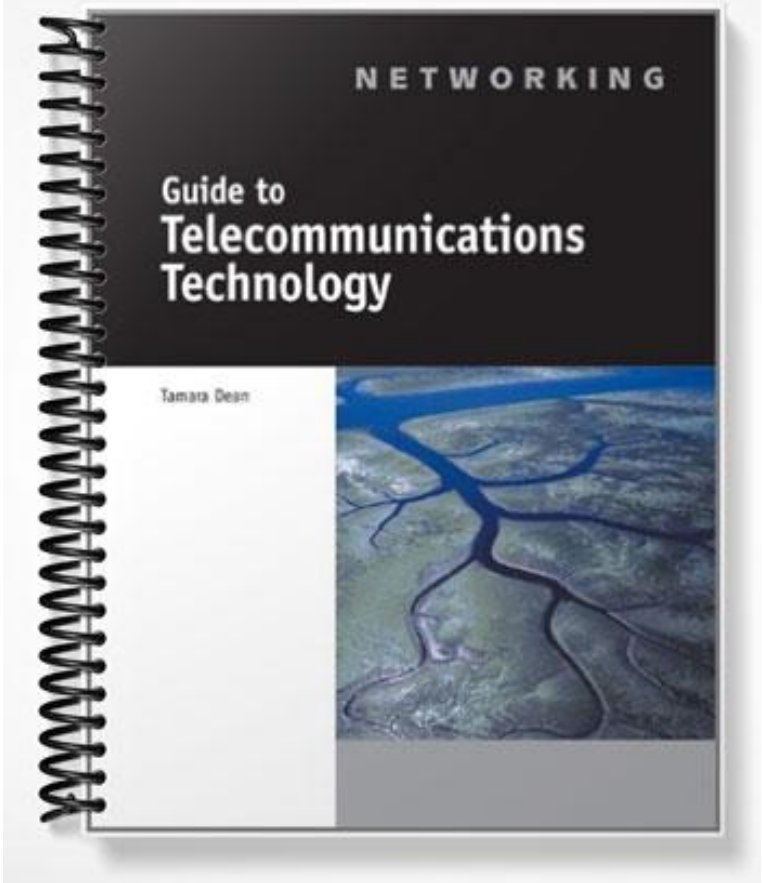
SOLUTIONS MANUAL



Guide to Telecommunications Technology

Chapter 2 Solutions

Review Questions

1. lightning is an example of static electricity
2. c
3. c
4. b
5. d
6. b
7. d
8. c
9. a
10. a
11. d
12. b
13. true
14. c
15. d
16. a
17. c
18. b
19. d
20. b
21. Digital signals are retransmitted while analog signals are amplified.
22. A
23. C
24. D
25. A
26. B
27. d
28. C
29. 9.98 (or approximately 10) minutes
30. false

Case Projects

1. Answers to the friend's question are:
    a. The amplifier will use current electricity.
    b. It will require direct current (DC) voltage. Some hobby-style amplifiers are designed to work with batteries; others require an AC/DC converter.
    c. The voltage will depend on the amplifier and its purpose. Typical battery operated, hobby-style amplifiers use between 6 and 15 volts. Amplifiers relying on a wall outlet and converter may use between 70 and 250 volts.
    d. As with voltage, current (or the number of amps) will vary widely (e.g., from 1 to 50 watts), depending on the type of amplifier.
    e. Components required to build the amplifier will require at least a power source, circuit board, wires, resistors, capacitors, and at least one speaker.

2. RFI, because it is the influence of one magnetic field on another, could affect the amplifier circuit. However, in order to completely cancel the amplifier's signal (thus rendering it silent), the RFI would have to be precisely opposite in phase, amplitude, and frequency to the amplifier's output signal. More likely, the friend's problem has to do with incorrect or incomplete construction of the amplifier.

3. Making an amplifier more powerful means increasing its wattage, or output. To do this, one could theoretically increase its voltage, increase its current, or decrease its resistance. Depending on the technique, this might require using a more powerful battery and rewiring the circuit to use different resistors and capacitors.