Answers to End-of-Chapter Questions

Matching

__g__ 1. whiteboard  “Fiber-Optic Cable”
__i__ 2. sending device  “Wired Communication via the PSTN”
__o__ 3. streaming  “Infrared”
__j__ 4. WiFi  “Bandwidth: How Much Do You Need?”
__m__ 5. Webcam  “Coaxial Cable”
__d__ 6. data transfer rate  “Moving Data: Bandwidth and Modems”
__n__ 7. WiMax  “Wired Communication via the PSTN”
__f__ 8. baud  “Radio”
__c__ 9. bandwidth  “Last-Mile Technologies”
__l__ 10. infrared  “Microwaves”
__e__ 11. receiving device  “Bandwidth: How Much Do You Need?”
__h__ 12. convergence  “Modems: Change or Adapt Signals from One Transmission System to Another”
__b__ 13. leased line  “Last Mile-Technologies”
__a__ 14. throughput  “Moving Data: Bandwidth and Modems”
__k__ 15. communication  “Bandwidth: How Much Do You Need?”
Multiple Choice

1. What is the technology that facilitates meetings that provide voice and video of individuals in different geographical locations?
   a. Videoconferencing
   b. Piconet
   c. PAN
   d. Piggybacking
   "Internet Telephony: Real-Time Voice and Video"

2. What communication medium must have a direct line of sight?
   a. WiMax
   b. Bluetooth
   c. WiFi
   d. Infrared
   "Infrared"

3. Which wireless technology makes use of short-range radio transmission to connect devices within 30 feet of each other?
   a. WiMAX
   b. Bluetooth
   c. DSL
   d. WiFi
   "Bluetooth"

4. GPS systems track locations by using which of the following technologies?
   a. PSTN
   b. Infrared
   c. Satellite
   d. PAN
   "Satellites"

5. Which is not a wired method of communication?
   a. WiFi
   b. Fiber Optics
   c. Twisted Pair
   d. Cable
   "WiFi"

6. Which is an example of convergence?
   a. A smartphone
   b. The installation of fiber optics for last-mile connectivity
   c. Global Positioning System (GPS)
   d. Converting a document to PDF format in order to be read by anyone.
   "Convergence: Is It A Phone or A Computer?"

7. Which communication uses light to transmit media?
   a. Twisted pair
   b. Fiber optics
   c. Cable
   d. Microwave
   "Last-Mile Technologies"
8. Which of the following is true of VoIP (Internet telephony)?
   a. It is not quite perfected and provides poor quality.
   b. **It is often cheaper than conventional home service.** “Internet Telephony: Real-Time Voice and Video”
   c. It is too expensive to install for home use and is used primarily for business.
   d. It requires a cable modem.

9. Which is not an example of a wireless transmission media?
   a. Infrared
   b. Microwave
   c. Satellite
   d. **Cable**

10. When someone makes a cellular phone call to another cellular phone, which of the following eventually handles the call?
    a. Public switched telephone network (PTSN)
    b. Global Positioning Satellite (GPS)
    c. **Mobile Switching Center (MSC)** “Cellular Telephones”
    d. Personal communication service (PCS)
Fill-In

1. __________ is the transformation of data such as voice, text, graphics, audio, and video into digital form.
   **Digitization**
   “Convergence: Is It A Phone or A Computer?”

2. __________ is a broad term that describes the ability to link various media and devices to enhance communications and improve access to information.
   **Connectivity**
   Chapter introduction

3. A(n) ________ is the area serviced by a subscriber loop carrier (SLC).
   **local loop**
   “Wired Communication Via the Public Switched Telephone Network”

4. __________ is the type of signal produced by the human voice.
   **Analog signal**
   “Moving Data: Bandwidth and Modems”

5. The region of coverage provided by a wireless phone network is called __________.
   **cell**
   “Cellular Telephones”

6. Accessing a network without permission is called _____________.
   **piggybacking**
   Ethics section

7. __________ is the technique used to send more than one call over a single line.
   **Multiplexing**
   “Wired Communication Via the Public Switched Telephone Network”

8. On a wireless phone network, the __________ monitors the cell phone’s signal strength to ensure best reception.
   **Mobile switching center (MSC)**
   “Cellular Telephones”

9. __________ is the set of standards that specifies how current wireless devices, through special Web browsers, can securely access the web.
   **WAP (Wireless Application Protocol)**
   “Web-Enabled Devices”

10. The bottleneck that occurs when data leaves high-speed cable transmission to unite with twisted pair phone lines to connect homes and businesses is called the ____________.
    **last mile problem**
    “Wired Communication Via the Public Switched Telephone Network”

11. ________ uses the Internet for real-time voice communication.
    **VOIP**
    “Internet Telephony: Real-Time Voice and Video”

12. _________ is the sending of an image of a document over a telephone line or the Internet.
**Facsimile transmission (or fax)**
“Faxing: Document Exchange”

13. Computers using wireless adapters use a special wireless communication device known as a(n) _________ to send and receive data.
**modem**
“Modems: Transform Signals”

14. A(n) _________ is a Web browser designed to meet the limitations of handheld devices.
**microbrowser**
“Web-Enabled Devices”

15. A network set up by a hacker within the operating area of a legitimate hot spot is referred to as a(n) _________ network.
**malicious network**
“Surfing Safely at Public Wireless Hot Spots”
Short Answer

1. Define modem and explain the purpose of this device in the communication process.

   A modem, short for modulator/demodulator, is a device that converts (modulates) the generated digital signal to a signal appropriate for the transmission medium; likewise, it transforms (demodulates) the incoming transmission signal to its digital equivalent. To transmit digital data over dial-up phone lines, it’s necessary to use a modem. On the sending end, the modem modulates the signal (transforms it into analog form). On the receiving end, the modem demodulates the signal (transforms it back into digital form).

2. List and describe three types of wired transmission media and three types of wireless transmission devices.

   1. Twisted pair wire is inexpensive copper cable used for telephone and data communications; it carries data at a rate of 1 Kbps or less.
   2. Coaxial cable is a high-bandwidth connecting cable in which an insulated wire runs through the middle of the cable; it has a data transfer rate of 10 Mbps.
   3. Fiber-optic cable is a network cable made from tiny strands of glasslike material that transmit light pulses with very high efficiency and can carry massive amounts of data; it has a data transfer rate of 10 Gbps or more.
   4. Infrared is a wireless system that includes a transmitter and receiver for sending and receiving signals; it has a data transfer rate of 4 Mbps.
   5. Radio is a wireless transmission medium that carries data via radio frequency signals.
   6. Bluetooth is a short-range radio transmission technology that has become very popular in recent years.

3. Explain the difference between microwave and satellite transmissions and how the two depend on each other.

   High-frequency radio waves called microwaves handled much of the long-distance telephone service before the recent growth of fiber-optic networks. Satellites transmit data by sending and receiving microwave signals to and from Earth-based stations.

4. List three mobile operating systems for mobile devices and provide an example of a device in which each is installed.

   Some of the systems include the following:

   1. The iPhone OS
   2. BlackBerry’s RIM operating system
   3. Symbian
   4. Android Windows Mobile
   5. Palm OS

   Device answers will vary.
6. What is the difference between bandwidth and throughput?

   **In regard to digital signals, throughput is the *actual* amount of data that is transmitted, whereas bandwidth is the theoretical maximum amount of data that can be transmitted through a given communications channel at one time (usually per second). Throughput is almost always lower than bandwidth, especially with wireless communications.**

7. Explain the last-mile problem. List the current technology being used to minimize this problem.

   The last-mile problem refers to the inability of homes or businesses to access the PSTN’s high-speed fiber-optic cables, along with the bottleneck of data on the last mile of twisted-pair phone lines connecting homes and businesses.

   Solutions to the last-mile problem include digital telephone standards (such as ISDN and DSL) that use twisted-pair wiring, and high-speed wired services (such as coaxial cable and cable modems).