TRUE/FALSE

1. Data is information that has been translated into a form that is more conducive to storage, transmission, and calculation.

   ANS: T PTS: 1 REF: 3

2. Some people call computer terminals thick-client workstations.

   ANS: F PTS: 1 REF: 6

3. A type of microcomputer-to-local area network connection that is growing in popularity is the wireless connection.

   ANS: T PTS: 1 REF: 6

4. To communicate with the Internet using a dial-up modem, a user's computer must connect to another computer that is already communicating with the Internet.

   ANS: T PTS: 1 REF: 7

5. It is not possible to connect two local area networks so that they can share peripherals as well as software.

   ANS: F PTS: 1 REF: 8

6. Metropolitan area networks can transfer data at fast, LAN speeds but over smaller geographic regions than typically associated with a local area network.

   ANS: F PTS: 1 REF: 9

7. The Internet is not a single network but a collection of thousands of networks.

   ANS: T PTS: 1 REF: 10

8. One of the most explosive areas of growth in recent years has been cellular phone networks.

   ANS: T PTS: 1 REF: 11

9. By the 1970s, telephone systems carried more computer data than voice.

   ANS: F PTS: 1 REF: 13

10. Network architectures are cohesive layers of protocols defining a set of communication services.

    ANS: T PTS: 1 REF: 14

11. The OSI model tells us what kind of wire or what kind of connector to use to connect the pieces of a network.

ANS: F PTS: 1 REF: 18

12. The application layer of the OSI model is responsible for token management.

ANS: F PTS: 1 REF: 18

13. The session layer of the OSI model is responsible for establishing synchronization points.

ANS: T PTS: 1 REF: 20

14. The network layer of the OSI model is an end-to-end layer.

ANS: F PTS: 1 REF: 20

15. The data link layer of the OSI model can incorporate some form of error detection software.

ANS: T PTS: 1 REF: 20

16. The TCP/IP protocol suite does not have rigidly defined layers as the OSI model does.

ANS: T PTS: 1 REF: 15

17. Telnet is used to allow a remote user to log in to another computer system.

ANS: T PTS: 1 REF: 16

18. SNMP is used to allow users to send and receive electronic mail.

ANS: F PTS: 1 REF: 16

19. The lowest layer of the TCP/IP protocol suite is the network access or physcial layer.

ANS: T PTS: 1 REF: 17

20. In a network architecture, as the packet moves *up* through the layers, the data packet shrinks in size.

ANS: T PTS: 1 REF: 23

MULTIPLE CHOICE

1. A ____ is an interconnection of computers and computing equipment using either wires or radio waves over small or large geographic areas.
   a. personal area network (PAN)
   b. computer network
   c. wireless network
   d. local area network (LAN)

   ANS: B PTS: 1 REF: 3

2. ____ is the transmission of multiple signals on one medium.
   a. Multiplexing
   b. Codec
   c. Modem
   d. Package

   ANS: A PTS: 1 REF: 3

3. ____ is the design, installation, and support of a network and its hardware and software.

a. Convergence
b. Voice network
c. Data network
d. Network management

ANS: D PTS: 1 REF: 4

4. ____ are the computers that store network software and shared or private user files.
a. Switches
b. Routers
c. Servers
d. Hubs

ANS: C PTS: 1 REF: 4

5. ____ are more advanced devices that are replacing hubs and are capable of filtering out unnecessary traffic.
a. Switches
b. Routers
c. Servers
d. Workstations

ANS: A PTS: 1 REF: 4

6. A ____ is a device that is essentially a keyboard and screen with no long-term storage capabilities and little, if any, processing power.
a. protocol
b. mainframe
c. thick-client
d. computer terminal

ANS: D PTS: 1 REF: 13

7. In a(n) ____ system, a user at a microcomputer, or client machine, issues a request for some form of data or service.
a. wireless
b. client/server
c. bridge
d. Internet

ANS: B PTS: 1 REF: 6

8. A modem and a dial-up telephone service provides data transfer rates of approximately ____.
a. 56,000 bits per second (56 kbps)
b. 112,000 bits per second (112 kbps)
c. 128,000 bits per second (128 kbps)
d. 256,000 bits per second (256 kbps)

ANS: A PTS: 1 REF: 7

9. The Internet “talks” only ____, so users must use software that supports this protocol.
a. IPX/SPX
b. DSL
c. TCP/IP
d. FTP

ANS: C PTS: 1 REF: 7

10. The devices that usually connect two or more LANs are the switch, hub, and ____.
a. workstation
b. access point
c. server
d. router

ANS: D PTS: 1 REF: 8

11. The personal area network was created in the late ____.
a. 1970s
b. 1980s
c. 1990s
d. 2000s

ANS: C PTS: 1 REF: 8

12. A ____ is a high-speed network that interconnects multiple sites within a close geographic region, such as a large urban area.
    a. metropolitan area network (MAN)
    b. wide area network (WAN)
    c. local area network (LAN)
    d. personal area network (PAN)

    ANS: A PTS: 1 REF: 9

13. Connecting two wide area networks requires devices such as high-speed ____.
    a. hubs
    b. routers
    c. bridges
    d. reflectors

    ANS: B PTS: 1 REF: 10

14. The ____ in a network architecture define a model for the functions or services that need to be performed.
    a. servers
    b. workstations
    c. routers
    d. layers

    ANS: D PTS: 1 REF: 14

15. The International Organization for Standardization (ISO) created the ____ reference model in an attempt to standardize the design of communication systems and the interoperability between their components.
    a. Open Systems Interconnection (OSI)
    b. TCP/IP
    c. FTP
    d. ASCII

    ANS: A PTS: 1 REF: 18

16. The ____ layer of the OSI model makes sure the data received at the very end of a transmission is exactly the same as the data originally transmitted.
    a. application
    b. session
    c. transport
    d. network access

    ANS: C PTS: 1 REF: 18

17. The ____ layer of the OSI model performs a series of miscellaneous functions necessary for presenting the data package properly to the sender or receiver.
    a. transport
    b. presentation
    c. applications
    d. session

    ANS: B PTS: 1 REF: 18

18. The ____ layer is the OSI layer that handles routing.
    a. network
    b. application
    c. transport
    d. session

    ANS: A PTS: 1 REF: 18

19. The ____ layer of the OSI model performs *end-to-end* error control and *end-to-end* flow control.
    a. application
    b. presentation
    c. transport
    d. session

    ANS: C PTS: 1 REF: 18

20. The ____ layer of the OSI model performs end-to-end connection control.
    a. transport
    c. physical

b. data link
d. session

ANS: A PTS: 1 REF: 18

21. ____ ensures that the network does not become saturated at any one point.
a. End-to-end error control
c. End-to-end flow control
b. Congestion control
d. Synchronization points control

ANS: B PTS: 1 REF: 17

22. The bottom layer in the OSI model—the ____ layer—handles the transmission of bits over a communications channel.
a. data link
c. physical
b. application
d. network

ANS: C PTS: 1 REF: 20

23. The ____ was not created by a standards-making organization but by a group of computer scientists.
a. OSI model
c. Relapse protocol
b. FTP protocol
d. TCP/IP protocol suite

ANS: D PTS: 1 REF: 15

24. The TCP/IP ____ layer supports network applications and may include presentation services.
a. transport
c. network
b. application
d. network access

ANS: B PTS: 1 REF: 15

25. ____ is used to allow the numerous elements within a computer network to be managed from a single point.
a. Simple Network Management Protocol (SNMP)
b. Simple Mail Transfer Protocol (SMTP)
c. Telnet
d. File Transfer Protocol (FTP)

ANS: A PTS: 1 REF: 16

26. The TCP/IP ____ layer commonly uses the Transmission Control Protocol (TCP) to maintain an error-free end-to-end connection.
a. network
c. transport
b. network access
d. application

ANS: C PTS: 1 REF: 17

27. The TCP/IP ____ layer, sometimes called the Internet layer, is roughly equivalent to OSI's network layer.
a. network access
c. transport
b. application
d. network

ANS: D PTS: 1 REF: 17

28. A(n) ____ connection is a nonphysical connection between sender and receiver that allows an exchange of commands and responses.
a. physical
c. real
b. encapsulated
d. logical

ANS: D PTS: 1 REF: 20

29. The addition of control information to a packet as it moves through the layers is called ____.
    a. encapsulation
    b. overloading
    c. payload
    d. filtering

    ANS: A PTS: 1 REF: 24

30. The merging together of two or more businesses or technologies is termed
    a. convergence
    b. inversion
    c. manipulation
    d. commercilization

    ANS: A PTS: 1 REF: 13

COMPLETION

1. Computer networks that use radio waves are termed _____ and can involve broadcast radio, microwaves, or satellite transmissions.

   ANS: wireless

   PTS: 1 REF: 3

2. _____ are personal computers or microcomputers where users reside.

   ANS: Workstations

   PTS: 1 REF: 4

3. _____ are sets of rules used by communication devices.

   ANS: Protocols

   PTS: 1 REF: 6

4. Metropolitan area networks are a cross between local area networks and _____ networks.

   ANS: wide area

   PTS: 1 REF: 9

5. A(n) _____ converts the local area network data into wide area network data.

   ANS: router

   PTS: 1 REF: 10

6. In a(n) _____ connection, the action of a person or object triggers a sensor that is connected to a network.

   ANS: sensor-to-local area network

   PTS: 1 REF: 10

7. A dictionary might define "_____" as the process of coming together toward single point.

   ANS: convergence

   PTS: 1 REF: 13

8. A(n) _____, or communications model, places the appropriate network pieces in layers.

   ANS: network architecture

   PTS: 1 REF: 14

9. The two most common architectures known today are the Open Systems Interconnection (OSI) model and the _____ protocol suite.

   ANS: TCP/IP

   PTS: 1 REF: 15

10. The OSI model consists of seven layers: application, presentation, session, _____, network, data link, and physical.

    ANS: transport

    PTS: 1 REF: 18

11. The top layer in the OSI model is the _____ layer, where the application using the network resides.

    ANS: application

    PTS: 1 REF: 18

12. The _____ layer of the OSI model is responsible for establishing sessions between users.

    ANS: session

    PTS: 1 REF: 20

13. _____ are backup points that are used in case of errors or failures.

    ANS: Synchronization points

    PTS: 1 REF: 20

14. The _____ layer of the OSI model is responsible for creating, maintaining, and ending network connections.

    ANS: network

PTS: 1 REF: 20

15. The _____ layer of the OSI model is responsible for taking data from the network layer and transforming it into a cohesive unit called a frame.

ANS: data link

PTS: 1 REF: 20

16. The _____ protocol suite incorporates the TCP and IP protocols and has in fact always been more popular than the OSI model.

ANS: TCP/IP

PTS: 1 REF: 15

17. _____ is used to transfer files from one computer system to another.

ANS:
File Transfer Protocol (FTP)
File Transfer Protocol
FTP

PTS: 1 REF: 16

18. _____ is used to allow Web browsers and servers to send and receive World Wide Web pages.

ANS:
Hypertext Transfer Protocol (HTTP)
Hypertext Transfer Protocol
HTTP

PTS: 1 REF: 16

19. The _____ is the software that prepares a packet of data so that it can move from one network to another on the Internet or within a set of corporate networks.

ANS:
Internet Protocol
Internet Protocol (IP)
IP

PTS: 1 REF: 17

20. The _____ connection is the only direct connection between sender and receiver and is at the physical layer, where actual 1s and 0s are transmitted over wires or airwaves.

ANS: physical

PTS: 1 REF: 20

21. The _____ layer of the TCP/IP protocol suite is responsible for making sure that what leaves one end of the network arrives at the other end of the network exactly the same.

ANS: transport

PTS: 1 REF: 17

ESSAY

1. What is data communications?

   ANS:
   We will define data communications as the transfer of digital or analog data using digital or analog signals. Once created, these analog and digital signals then are transmitted over conducted media or wireless media. Both the data and the signal can be analog or digital, allowing for four possible combinations. Transmitting analog data by analog signals and digital data by digital signals are fairly straightforward processes—the conversion from one form to another is relatively simple. Transmitting digital data using analog signals, however, requires the digital data to be modulated onto an analog signal, which is what happens with a modem and the telephone system. Transmitting analog data using digital signals requires the data to be sampled at specific intervals and then digitized into a digital signal, which is what happens with a device called a digitizer, or codec.

   PTS: 1 REF: 3

2. What are the components of a wide area network?

   ANS:
   Wide area networks also can be of many types. Although many different technologies are used to support wide area networks, all wide area networks include the following components:
   * Nodes, which are the computing devices that allow workstations to connect to the network and that make the decisions about where to route a piece of data
   * Some type of high-speed transmission line, which runs from one node to another
   * A sub-network, which consists of the nodes and transmission lines, collected into a cohesive unit

   PTS: 1 REF: 4

3. What are the benefits of a microcomputer-to-local area network connection?

   ANS:
   Perhaps the most common network connection today, the microcomputer-to-local area network (LAN) connection is found in virtually every business and academic environment—and even in many homes. The LAN is an excellent tool for sharing software and peripherals. In some LANs, application software, such as project management or spreadsheet software, resides on a central computer called a server. Using microcomputers connected to a LAN, end users can request and download an application, then execute it on their computers. If users wish to print documents on a high-quality network printer, the LAN contains the network software necessary to route their print requests to the appropriate printer. If users wish to access their e-mail from the corporate e-mail server, the local area network provides a fast, stable connection between user workstations and the e-mail server.

   PTS: 1 REF: 7

4. Explain what is meant by personal area network-to-workstation connections.

   ANS:

The personal area network was created in the late 1990s and is one of the newer forms of computer networks. Using wireless transmissions with devices such as personal digital assistants (PDAs), laptop computers, and portable music players, an individual can transfer voice, data, and music from handheld devices to other devices such as microcomputer workstations. Likewise, a user can download data from a workstation to one of these portable devices. For example, a user may use a PDA to record notes during a meeting. Once the meeting is over, the user can transmit the notes over a wireless connection from the PDA to his or her workstation. The workstation then runs a word processor to clean up the notes, and the formatted notes are uploaded to a local area network for corporate dissemination.

PTS: 1 REF: 8

5. Briefly explain some examples of convergence in the wireless market.

ANS:
Today we see many different examples of convergence, particularly in the wireless markets. For example, it is now quite common to snap a photo using a cell phone and then transfer the image over the cell phone network to another cell phone. Shortly after the introduction of photo-enabled cell phones, cell phones also became capable of sending and receiving instant messages. Then in 2005, cell phone providers started offering services that allow a user to transmit high-speed data over a cell phone connection. These all are examples of the convergence of two different applications (for example, digital photography and cell phones in the case of photo-enabled cell phones) into a single technology.

PTS: 1 REF: 13