Processes, Systems, and Information, 3e **(McKinney/Kroenke)**
Chapter 3   Networks and the Cloud

1) A personal area network (PAN) connects devices around a single person.
Answer: TRUE
Difficulty: Easy
AACSB: Information Technology
Chapter LO: 1: What do business professionals need to know about networks and the Internet?
Course LO: Describe the major types of computer hardware and software used by companies

2) The distinguishing characteristic of a LAN is a single location.
Answer: TRUE
Difficulty: Easy
AACSB: Information Technology
Chapter LO: 1: What do business professionals need to know about networks and the Internet?
Course LO: Describe the major types of computer hardware and software used by companies

3) Wide area networks (WANs) connect computers at different geographic locations.
Answer: TRUE
Difficulty: Easy
AACSB: Information Technology
Chapter LO: 1: What do business professionals need to know about networks and the Internet?
Course LO: Describe the major types of computer hardware and software used by companies

4) Bluetooth is a technology that allows devices to connect wirelessly to a LAN.
Answer: FALSE
Difficulty: Easy
AACSB: Information Technology
Chapter LO: 1: What do business professionals need to know about networks and the Internet?
Course LO: Describe the major types of computer hardware and software used by companies

5) A cellular network, also called a mobile network or wireless WAN (WWAN).
Answer: TRUE
Difficulty: Easy
AACSB: Information Technology
Chapter LO: 1: What do business professionals need to know about networks and the Internet?
Course LO: Describe the major types of computer hardware and software used by companies

6) Internet service providers (ISP) collect money from their customers and pay access fees and other charges on your behalf.
Answer: TRUE
Difficulty: Easy

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AACSB: Information Technology
Chapter LO: 1: What do business professionals need to know about networks and the Internet?
Course LO: Describe the major types of computer hardware and software used by companies

7) The three wireless network options are: Bluetooth, cellular and DSL.
Answer: FALSE
Difficulty: Easy
AACSB: Information Technology
Chapter LO: 1: What do business professionals need to know about networks and the Internet?
Course LO: Describe the major types of computer hardware and software used by companies

8) The three common alternatives for connecting to the Internet are WAN, Cable line, and DSL.
Answer: FALSE
Difficulty: Easy
AACSB: Information Technology
Chapter LO: 1: What do business professionals need to know about networks and the Internet?
Course LO: Describe the major types of computer hardware and software used by companies

9) A digital subscriber line (DSL) operates on the same lines as voice telephones, but it operates so that its signals do not interfere with voice telephone service.
Answer: TRUE
Difficulty: Easy
AACSB: Information Technology
Chapter LO: 1: What do business professionals need to know about networks and the Internet?
Course LO: Describe the major types of computer hardware and software used by companies

10) Up to 500 user sites can share a cable line, and performance varies depending on how many other users are sending and receiving data.
Answer: TRUE
Difficulty: Easy
AACSB: Information Technology
Chapter LO: 1: What do business professionals need to know about networks and the Internet?
Course LO: Describe the major types of computer hardware and software used by companies

11) Wide area networks are used to connect computers that reside in a single geographic location.
Answer: FALSE
Difficulty: Easy
AACSB: Information Technology
Chapter LO: 1: What do business professionals need to know about networks and the Internet?
Course LO: Compare and contrast different ways of connecting to the Internet

12) Protocols are used to provide seamless flow of data.
Answer: True
Difficulty: Easy
AACSB: Information Technology
Chapter LO: 2: How does data move over a network?
Course LO: Describe the major types of computer hardware and software used by companies

13) Ethernet or the IEEE 802.3 protocol is used for wired LAN connections. This protocol standard, specifies hardware characteristics, such as which wire carries which signals.
Answer: True
Difficulty: Easy
AACSB: Information Technology
Chapter LO: 2: How does data move over a network?
Course LO: Describe the major types of computer hardware and software used by companies

14) Encapsulation involves breaking up an image, which is too big to travel in one piece, into parts called packets.
Answer: FALSE
Difficulty: Moderate
AACSB: Information Technology
Chapter LO: 2: How does data move over a network?
Course LO: Describe the major types of computer hardware and software used by companies

15) TCP/IP Protocol architecture is a scheme of protocol types arranged in layers.
Answer: TRUE
Difficulty: Moderate
AACSB: Information Technology
Chapter LO: 2: How does data move over a network?
Course LO: Describe the major types of computer hardware and software used by companies

16) When you use a browser like Edge, Safari, or Chrome to upload your image to Snapchat, you are using a program that implements the http protocol.
Answer: TRUE
Difficulty: Moderate
AACSB: Information Technology
Chapter LO: 2: How does data move over a network?
Course LO: Describe the major types of computer hardware and software used by companies

17) Whenever you see http in your browser's address bar, you have a secure transmission and you can safely send sensitive data like credit card numbers.
Answer: FALSE
Difficulty: Moderate
AACSB: Information Technology
Chapter LO: 2: How does data move over a network?
Course LO: Describe the major types of computer hardware and software used by companies

18) FTP, or File Transfer Protocol, is used for email transmissions.

Answer: FALSE
Difficulty: Easy
AACSB: Information Technology
Chapter LO: 2: How does data move over a network?
Course LO: Describe the major types of computer hardware and software used by companies

19) To connect to the Internet, every device needs an IP address.
Answer: TRUE
Difficulty: Easy
AACSB: Information Technology
Chapter LO: 2: How does data move over a network?
Course LO: Describe the major types of computer hardware and software used by companies

20) While protocols are rules for devices to follow, they don't specify any particular language.
Answer: TRUE
Difficulty: Easy
AACSB: Information Technology
Chapter LO: 2: How does data move over a network?
Course LO: Describe the major types of computer hardware and software used by companies

21) Hypertext Markup Language (html) is the most common language for defining the structure
and layout of Web pages.
Answer: TRUE
Difficulty: Easy
AACSB: Information Technology
Chapter LO: 2: How does data move over a network?
Course LO: Describe the major types of computer hardware and software used by companies

22) Cascading Style Sheets (CSS) define the fonts and layout of all elements on web pages and
are an example of service-oriented architecture (SOA).
Answer: False
Difficulty: Moderate
AACSB: Information Technology
Chapter LO: 2: How does data move over a network?
Course LO: Describe the major types of computer hardware and software used by companies

23) AT&T is an example of a Tier 1 network provider.
Answer: True
Difficulty: Easy
AACSB: Information Technology
Chapter LO: 2: How does data move over a network?
Course LO: Describe the major types of computer hardware and software used by companies

24) Simple Mail Transfer Protocol (SMTP) is the transmission protocol used primarily to move
files over the Internet.
Answer: FALSE
Difficulty: Easy

25) Three-tier architecture, which is an arrangement of user computers and servers into three categories, or tiers.
Answer: TRUE

26) Almost all social media apps and e-commerce sites use the three-tier architecture.
Answer: TRUE

27) In the three-tier architecture, the server tier consists of computers, phones, and other devices that have browsers that request and process web pages.
Answer: FALSE

28) Web servers are software programs that run on a database tier computer.
Answer: FALSE

29) Work is distributed among the computers in a web farm to minimize customer delays.
Answer: TRUE

30) The user tier consists of computers, smartphones, and other devices that have browsers that request and process.
Answer: TRUE

Course LO: Compare and contrast different ways of connecting to the Internet

31) A login server is an app program that runs on a server-tier computer.
Answer: TRUE
Difficulty: Easy
AACSB: Information Technology
Chapter LO: 3: How does a typical Web server move data on a network?
Course LO: Compare and contrast different ways of connecting to the Internet

32) A web page is a document that is coded in one of the standard page markup languages.
Answer: TRUE
Difficulty: Easy
AACSB: Information Technology
Chapter LO: 3: How does a typical Web server move data on a network?
Course LO: Compare and contrast different ways of connecting to the Internet

33) Your browser sends requests and receives responses for service encoded in a predefined http request format.
Answer: TRUE
Difficulty: Easy
AACSB: Information Technology
Chapter LO: 3: How does a typical Web server move data on a network?
Course LO: Compare and contrast different ways of connecting to the Internet

34) The cloud is the elastic leasing of pooled computer resources over the Internet.
Answer: TRUE
Difficulty: Easy
AACSB: Information Technology
Chapter LO: 4: Why is the cloud the future for most organizations?
Course LO: Describe the major types of computer hardware and software used by companies

35) The term elastic, which was first used this way by Amazon, means that the amount of resources leased can be increased or decreased dynamically and programmatically, in a short span of time.
Answer: TRUE
Difficulty: Easy
AACSB: Information Technology
Chapter LO: 4: Why is the cloud the future for most organizations?
Course LO: Describe the major types of computer hardware and software used by companies

36) Cloud resources are pooled, but only one organization can use the physical hardware at a time.
Answer: FALSE
Difficulty: Easy
AACSB: Information Technology
Chapter LO: 4: Why is the cloud the future for most organizations?
Course LO: Describe the major types of computer hardware and software used by companies

37) According to economies of scale, the average cost of production decreases as the size of the operation increases.
Answer: FALSE
Difficulty: Easy
AACSB: Information Technology
Chapter LO: 4: Why is the cloud the future for most organizations?
Course LO: Describe the major types of computer hardware and software used by companies

38) The commonality of Internet protocols and SOA enables cloud-hosting vendors to provide processing capabilities in flexible yet standardized ways.
Answer: TRUE
Difficulty: Moderate
AACSB: Information Technology
Chapter LO: 4: Why is the cloud the future for most organizations?
Course LO: Describe the major types of computer hardware and software used by companies

39 Cloud-based hosting is becoming less and less popular.
Answer: FALSE
Difficulty: Easy
AACSB: Information Technology
Chapter LO: 4: Why is the cloud the future for most organizations?
Course LO: Describe the major types of computer hardware and software used by companies

40) Control of data is the primary advantage of cloud hosting.
Answer: FALSE
Difficulty: Moderate
AACSB: Information Technology
Chapter LO: 4: Why is the cloud the future for most organizations?
Course LO: Describe the major types of computer hardware and software used by companies

41) Outsourcing is the process of hiring another organization to perform a service.
Answer: TRUE
Difficulty: Moderate
AACSB: Information Technology
Chapter LO: 4: Why is the cloud the future for most organizations?
Course LO: Describe the major types of computer hardware and software used by companies

42) Application programs are provided by vendors under platform as a service (PaaS).
Answer: FALSE
Difficulty: Easy
AACSB: Information Technology
Chapter LO: 5: What are the typical cloud options?
Course LO: Describe the major types of computer hardware and software used by companies

43) Platform as a service (PaaS) is where vendors provide hosted computers, an operating system, and possibly a DBMS.

Answer: TRUE
Difficulty: Easy
AACSB: Information Technology
Chapter LO: 5: What are the typical cloud options?
Course LO: Describe the major types of computer hardware and software used by companies

44) Which of these is not an example of a network:
A) personal area network (PAN)
B) intranet.
C) local area network (LAN)
D) Wide area networks (WANs)
Answer: B
Difficulty: Easy
AACSB: Information Technology
Chapter LO: 1: What do business professionals need to know about networks and the Internet?
Course LO: Describe the major types of computer hardware and software used by companies

45) A special-purpose computer that receives and transmits wired traffic on the LAN is a/an:
A) SOHO LAN
B) internet
C) switch
D) cellular network
Answer: A
Difficulty: Easy
AACSB: Information Technology
Chapter LO: 1: What do business professionals need to know about networks and the Internet?
Course LO: Describe the major types of computer hardware and software used by companies

46) With a _____, an organization can place communication lines wherever it wants because all lines reside on its premises.
A) WAN
B) PAN
C) network
D) LAN
Answer: D
Difficulty: Easy
AACSB: Information Technology
Chapter LO: 1: What do business professionals need to know about networks and the Internet?
Course LO: Describe the major types of computer hardware and software used by companies

47) A private internet used exclusively within an organization is sometimes called a/an _____.
A) internet
B) intranet
C) LAN (local area network)

D) PAN (personal area network)
Answer: B
Difficulty: Easy
AACSB: Information Technology
Chapter LO: 1: What do business professionals need to know about networks and the Internet?
Course LO: Describe the major types of computer hardware and software used by companies

48) _____ is a wireless communication method that is used for transmitting data over short distances, such as in wireless keyboards.
A) Bluetooth
B) WiFi
C) Cellular data
D) WWAN
Answer: A
Difficulty: Easy
AACSB: Information Technology
Chapter LO: 1: What do business professionals need to know about networks and the Internet?
Course LO: Describe the major types of computer hardware and software used by companies

49) Like Wi-Fi, cellular communication uses _____.
A) networks
B) radio waves
C) special telephone lines
D) cable lines
Difficulty: Easy
AACSB: Information Technology
Chapter LO: 1: What do business professionals need to know about networks and the Internet?
Course LO: Describe the major types of computer hardware and software used by companies

50) If a mobile user moves out of an original cell, the user is automatically switched to an adjoining cell. This is known as a/an:_____.
A) handover
B) switch
C) different frequency
D) mobile network
Answer: A
Difficulty: Moderate
AACSB: Information Technology
Chapter LO: 1: What do business professionals need to know about networks and the Internet?
Course LO: Describe the major types of computer hardware and software used by companies

51) Which of the following is not a function of an ISP (Internet Service Provider)?
A) a legitimate Internet address

B) pay access fees and other charges on your behalf
C) serves as a gate-way to the Internet
D) transmits data over short distances
Answer: D
Difficulty: Moderate
AACSB: Information Technology
Chapter LO: 1: What do business professionals need to know about networks and the Internet?
Course LO: Describe the major types of computer hardware and software used by companies

52) A/an _____ operates on the same lines as voice telephones, but it operates so that its signals do not interfere with voice telephone service.
A) cable line
B) cellular data
C) digital subscriber line (DSL)
D) WAN
Answer: C
Difficulty: Moderate
AACSB: Information Technology
Chapter LO: 1: What do business professionals need to know about networks and the Internet?
Course LO: Describe the major types of computer hardware and software used by companies

53) Computers in a small hospital are most likely connected to each other using _____.
A) WAN
B) VPN
C) LAN
D) Bluetooth
Answer: C
Difficulty: Easy
AACSB: Information Technology
Chapter LO: 1: What do business professionals need to know about networks and the Internet?
Course LO: Compare and contrast different ways of connecting to the Internet

54) _____is the protocol used between browsers and Web servers.
A) TCP/IP Protocol architecture
B) Smtp, or Simple Mail Transfer Protocol
C) IP (Internet Protocol
D) Hypertext Transport Protocol (http)
Answer: D
Difficulty: Moderate
AACSB: Information Technology
Chapter LO: 2: How does data move over a network?
Course LO: Describe the major types of computer hardware and software used by companies

55) The _____protocol is used for wired LAN connections.

A) IEEE 802.3
B) IEEE 802.11
C) IEEE 802.11ac
D) 104.193.184.125
Answer: A
Difficulty: Moderate
AACSB: Information Technology
Chapter LO: 2: How does data move over a network?
Course LO: Describe the major types of computer hardware and software used by companies

56) Which of the following is not a protocol type:
A) Hypertext Transport
B) SMTP, or Simple Mail Transfer
C) XML
D) IP
Answer: C
Difficulty: Moderate
AACSB: Information Technology
Chapter LO: 2: How does data move over a network?
Course LO: Describe the major types of computer hardware and software used by companies

57) _____ a worldwide-unique name that is affiliated with a particular public IP address.
A) IP address
B) domain name
C) IPv6
D) IPv4
Answer: B
Difficulty: Easy
AACSB: Information Technology
Chapter LO: 2: How does data move over a network?
Course LO: Describe the major types of computer hardware and software used by companies

58) An html _____is a notation used to define a data element for display or other purposes.
A) angle bracket
B) tag
C) hyperlink
D) attribute
Answer: B
Difficulty: Easy
AACSB: Information Technology
Chapter LO: 2: How does data move over a network?
Course LO: Describe the major types of computer hardware and software used by companies

59) _____is the most common language for defining the layout and structure of web pages.
A) xml
B) CSS
C) html

D) SOA
Answer: C
Difficulty: Easy
AACSB: Information Technology
Chapter LO: 2: How does data move over a network?
Course LO: Describe the major types of computer hardware and software used by companies

60) Which of the following is an application layer protocol?
A) VPN
B) TCP/IP Protocol architecture
C) WNIC
D) IEEE
Answer: B
Difficulty: Moderate
AACSB: Information Technology
Chapter LO: 2: How does data move over a network?
Course LO: Compare and contrast different ways of connecting to the Internet

61) Service-oriented architecture (SOA) provides a way for apps on a network to talk to each other using all these ways, except:
A) standard protocols to publish a menu of services that the application provides
B) the structure of the data that it expects to receive
C) providing metadata about the page
D) the structure of the data that it will produce
Answer: C
Difficulty: Easy
AACSB: Information Technology
Chapter LO: 2: How does data move over a network?
Course LO: Describe the major types of computer hardware and software used by companies

62) All of the following are examples of Tier 1 providers except for:
A) Sprint
B) Century
C) Verizon
D) Netflix
Answer: D
Difficulty: Easy
AACSB: Information Technology
Chapter LO: 2: How does data move over a network?
Course LO: Describe the major types of computer hardware and software used by companies

63) _____agreements that specify how the data will move among providers.
A) Peering
B) Tier 1
C) Internet
D) Carrier
Answer: A

Difficulty: Easy
AACSB: Information Technology
Chapter LO: 2: How does data move over a network?
Course LO: Describe the major types of computer hardware and software used by companies

64) XML is the most common markup language for defining the structure and layout of Web pages.
Answer: FALSE
Difficulty: Easy
AACSB: Information Technology
Chapter LO: 2: How does data move over a network?
Course LO: Compare and contrast different ways of connecting to the Internet

65) An address on the Internet is called a(n) _____.
A) VPN
B) TCP
C) IP Address
D) FTP
Answer: C
Difficulty: Easy
AACSB: Information Technology
Chapter LO: 2: How does data move over a network?
Course LO: Compare and contrast different ways of connecting to the Internet

66) Which of the following statements is true about domain names?
A) It is a worldwide-unique name that is associated with a particular Internet address.
B) A nation's government is the only body allowed to register domain names on Internet directories.
C) An Internet address can be associated with only one domain name.
D) It is usually written before a protocol in a URL.
Answer: A
Difficulty: Moderate
AACSB: Information Technology
Chapter LO: 2: How does data move over a network?
Course LO: Compare and contrast different ways of connecting to the Internet

67) Which of the following is not a tier in three-tier architecture?
A) user
B) server
C) web
D) database
Answer: C
Difficulty: Easy
AACSB: Information Technology
Chapter LO: 3: How does a typical Web server move data on a network?
Course LO: Compare and contrast different ways of connecting to the Internet

68) _____are software programs that run on a server-tier computer and that manage http traffic by sending and receiving Web pages to and from clients.
A) DBMS
B) Web farms
C) Web pages
D) Web servers
Answer: Answer: D
Difficulty: Easy
AACSB: Information Technology
Chapter LO: 3: How does a typical Web server move data on a network?
Course LO: Compare and contrast different ways of connecting to the Internet

69) Database management system (DBMS) processes requests to:
A) retrieve and store data
B) process application programs
C) request and process Web pages
D) manage http traffic
Answer: Answer: A
Difficulty: Easy
AACSB: Information Technology
Chapter LO: 3: How does a typical Web server move data on a network?
Course LO: Compare and contrast different ways of connecting to the Internet

70) Which of the following statements is true about the cloud?
A) Cloud vendors dynamically allocate physical servers as customer needs vary.
B) The amount of resources that is leased out to organizations is decided by their lease contracts.
C) The amount of resources leased can be increased or decreased
dynamically
D) Every organization that uses cloud services is allotted only one virtual machine.
Answer: C
Difficulty: Moderate
AACSB: Information Technology
Chapter LO: 4: Why is the cloud the future for most organizations?
Course LO: Describe the major types of computer hardware and software used by companies

71) Which of the following statements is true about cloud computing?
A) It is yet to be adopted on a large scale as it is expensive.
B) It enables many different organizations to use the same physical hardware
C) It is the leasing out of a fixed amount of server time and resources.
D) It has a negative impact on cloud vendors as they do not benefit from economies of scale.
Answer: B
Difficulty: Moderate
AACSB: Information Technology
Chapter LO: 4: Why is the cloud the future for most organizations?
Course LO: Describe the major types of computer hardware and software used by companies

72) Which of the following is a characteristic of cloud hosting?

A) Even the most reputable organizations do not offer security for cloud hosting.
B) Organizations that hire cloud services run the risk of investing in technology that may become obsolete.
C) Cloud-hosting offers a high degree of transparency on data backup and security.
D) Cloud-hosting offers best-of-breed security and disaster recovery.
Answer: D
Difficulty: Moderate
AACSB: Information Technology
Chapter LO: 4: Why is the cloud the future for most organizations?
Course LO: Describe the major types of computer hardware and software used by companies

73) Which of the following has not contributed to cloud-based hosting being advantageous today.
A) data communication is so cheap
B) SOA and protocol adoption have made the cloud even more economical
C) data storage is nearly free
D) being subject to changes in the vendor's management, policy, and prices
Answer: D
Difficulty: Moderate
AACSB: Information Technology
Chapter LO: 4: Why is the cloud the future for most organizations?
Course LO: Describe the major types of computer hardware and software used by companies

74) What are the four basic types of networks? Provide an example of each.
Answer: A personal area network (PAN) connects devices around a single person. Most of these devices connect wirelessly with other devices up to about 10 meters. An example of a PAN is a wearable device such as a Fitbit connected to a mobile device such as an iPhone. A local area network (LAN) connects computers that reside in a single geographic location.
The number of connected computers can range from two to several hundred. The distinguishing characteristic of a LAN is a single location. The computers for a College of Business located on a single campus can be connected via a LAN. Small office or a home office (SOHO) LANs support fewer than a dozen or so smart-phones, computers, and printers. Wide area networks (WANs) connect computers at different geographic locations. The computers in two separated company sites must be connected using a WAN. The computers for a College of Business located on multiple campuses must be connected via a WAN.
Difficulty: Easy
AACSB: Information Technology
Chapter LO: 1: What do business professionals need to know about networks and the Internet?
Course LO: Describe the major types of computer hardware and software used by companies

75) Explain the physical layout of a cellular network and how it sends/receives data to its users.
Answer: A cellular network, also called a mobile network or wireless WAN (WWAN), is a communication network that uses radio signals to send and receive data to mobile users. Users wirelessly connect to stationary base stations, also known as cell towers, using a variety of frequencies with low power. The base stations are connected to each adjoining station and to a mobile switching center (or MTSO). The switching center connects users to the Internet. Like

Wi-Fi, cellular communication uses radio waves, but cellular radio range is greater than Wi-Fi and uses different frequencies. Cells in the network are typically hexagonal shapes. Although most base stations are omnidirectional and located in the middle of cells, they can be directional as is common with stadiums and highways. Cells can vary in size from a half mile in diameter in urban settings to 25 miles in remote locations. When a mobile user contacts a network a base station assigns a frequency to that user. If the user moves out of the original cell a handover or handoff is accomplished which switches the end user to an adjoining cell base station automatically. The gaining base station can reuse the original frequency or change to a new frequency.
Difficulty: Moderate
AACSB: Information Technology
Chapter LO: 1: What do business professionals need to know about networks and the Internet?
Course LO: Describe the major types of computer hardware and software used by companies

76) Why have cellular networks become popular?
Answer: Cellular networks have become more popular as they have grown in capabilities and capacities. This evolution in features is called generations. As these features have grown in utility and diminished in cost, mobile networks are now more popular than fixed net-works in many countries and are the only method of digital communication in some countries, particularly in Africa.
Difficulty: Easy
AACSB: Information Technology
Chapter LO: 1: What do business professionals need to know about networks and the Internet?
Course LO: Describe the major types of computer hardware and software used by companies

77) Explain the services that an ISP provides and list the three common ways to connect to the Internet.
Answer: An ISP offers access to the Internet and other associated services. It has three important functions. First, it provides you with a legitimate Internet address. Second, it serves as your gate-way to the Internet. The ISP receives the communications from your computer and passes them on to the Internet, and it receives communications from the Internet and passes them on to you. Finally, ISPs pay for the Internet. They collect money from their customers and pay access fees and other charges on your behalf. The three common alternatives for connecting to the Internet include a WAN, a digital subscriber line (DSL), and cable line.
Difficulty: Easy
AACSB: Information Technology
Chapter LO: 1: What do business professionals need to know about networks and the Internet?
Course LO: Describe the major types of computer hardware and software used by companies

78) What are protocols? Provide a few examples of protocols.
Answer: A protocol is a set of rules used by two communicating devices. You are not a device, but you use protocols. You speak differently to your friends than your parents or a three-year old. It's still English for all three, but the rules are different—you banter with friends, you exercise patience with your parents, and you fill in blanks with the three-year old. You use and reuse

these protocols in many different situations to communicate with different types of people. The same is true of devices on the Internet. We program them with many protocols so they can communicate in a wide variety of settings with a wide variety of other devices. The devices on a LAN use common protocols to talk with each other and accommodate new devices. The IEEE 802.3 protocol is used for wired LAN connections. This protocol standard, also called ethernet, specifies hardware characteristics, such as which wire carries which signals. Wireless LAN connections use the IEEE 802.11 protocol. Several versions of 802.11 exist, and as of 2017 the most current one is IEEE 802.11ac. The differences among these versions are beyond the scope of this discussion. The current standard, 802.11ac, allows speeds of up to 1300 Mbps, a 100 percent increase in speed over the previous protocol in just over 4 years.
Difficulty: Easy
AACSB: Information Technology
Chapter LO: 2: How does data move over a network?
Course LO: Compare and contrast different ways of connecting to the Internet

79) Use the example of Snapchat to describe how protocols work on the Internet. Be sure to include the two techniques that can be used in this process.
Answer: Communication with Snapchat Web servers involves nearly unimaginable complexity. Somehow, your smartphone communicates with servers half a world away even though these devices most likely have not interacted before. You can upload any image type, size, or format, and you don't have to care about any of the devices that will carry your image to Snap-chat. Your image might show up on a watch, a smartphone, or the side of a refrigerator, but it's your exact image, every time. This process depends on two techniques. First, your upload, which is too big to travel in one piece, is broken up into parts called packets, and each packet passed along from WAN to WAN in such a way that it arrives intact. Then your original image is reassembled, any parts that were lost or damaged are resent, and the reconstructed image is delivered to the server for processing. The second technique is encapsulation. Each of your packets swimming their way from you to Snapchat is encapsulated, enveloped, inside a container of protocols. Each packet is contained within several containers, several layers of these protocols. Your device and ISP wrap these layers on, and the Snapchat servers take them off, like envelopes within envelopes.
Difficulty: Moderate
AACSB: Information Technology
Chapter LO: 2: How does data move over a network?
Course LO: Compare and contrast different ways of connecting to the Internet

80) Explain HTTP and HTTPS in general terms.
Answer: Hypertext Transport Protocol (http)is the protocol used between browsers and Web servers. When you use a browser like Edge, Safari, or Chrome to upload your image to Snapchat, you are using a program that implements the http protocol. At the other end, the Snapchat server also processes http. Even though your browser and the Web server have never "met" before, they can communicate with one another because they both follow the rules of http. Your browser sends requests for service encoded in a predefined http request format. The server receives that request, processes the request (in this case to upload an image), and formats a response in a predefined http response format. A secure version of http is available called https. Whenever you see https in your browser's address bar, you have a secure transmission and you can safely send sensitive data like credit card numbers.

81) What is an IP address? Explain the difference between public and private. Describe both IP address formats.
Answer: Every location on the Internet uses an address, called an IP address, which is a number that uniquely identifies its location to connect to the Internet every device needs an IP address. Public IP addresses identify a particular device on the public Internet. Private IP addresses identify a particular device on a private network, usually on a LAN. These private addresses are controlled within the LAN. When you connect to your LAN, your laptop receives a private IP address, and when you use the Internet, your ISP gives you an IP address, probably a temporary one while you use the Internet. IP addresses have two formats; the older version is IPv4, which has a four-decimal dotted for-mat such as 104.193.184.125 (a previous IP address for Snapchat). The more recent version, IPv6, is much longer. If you type into a browser the IP address, it will connect with the device at that address.

82) What is Hypertext Markup Language (html)? How are Cascading Style Sheets (CSS used in html?
Answer: Hypertext Markup Language (html)is the most common language for defining the structure and layout of Web pages. An html tag is a notation used to define a data element for display
or other purposes. The start of this tag is indicated by <h2>, and the end of the tag is indicated by </h2>. The words between the tags are the value of the tag. This html tag means to place the words "Price of Item" on a Web page in the style of a level-two heading. The creator of the Web page will define the style (font size, color, and so forth) for h2 headings and the other tags to be used. Web pages include hyperlinks, which are pointers to other Web pages. A hyperlink contains the URL of the Web page to find when the user clicks the hyperlink. The URL can reference a page on the server that generated the page containing the hyperlink, or it can reference a page on another server. HTML pages are often supported by Cascading Style Sheets (CSS). A CSS defines the fonts and layout of all the elements on pages on a Web site so that the site has one consistent look and feel. For example, every <h2> value will be displayed the same way on every page. It is easier to write a CSS that governs all the various pages on a Web site than to write each font and indentation for every page.

83) What is XML(Extensible Markup Language)?
Answer: XML(Extensible Markup Language) is a markup language like html but is machine readable and was designed to enable the exchange of structured data over the Web. A tag in

XML might be <customer_address>, which would tell the Web app reading the page the address of the customer.
Difficulty: Easy
AACSB: Information Technology
Chapter LO: 2: How does data move over a network?
Course LO: Compare and contrast different ways of connecting to the Internet

84) What is a carrier's role in moving data across the Internet?
Answer: As your data moves across the Internet it moves between several large WANs operated by telecommunication providers. These carriers in the United States include AT&T, Verizon, Sprint, and Century. They form the Internet backbone and are called Tier 1 network providers. These providers earn revenue by selling services to ISPs, which connect to the Internet via these Tier 1 providers. Each of these large network providers freely shares its data with other Tier 1 providers. The exchanges are governed by peering agreements that specify how the data will move among providers.
Difficulty: Easy
AACSB: Information Technology
Chapter LO: 2: How does data move over a network?
Course LO: Compare and contrast different ways of connecting to the Internet

85) Explain what *net neutrality* is and how it would affect carriers:
Answer: One significant issue is that some Internet participants use a great deal of the bandwidth on these Tier 1 networks compared to the rest of us. In fact, Netflix uses about a third of all Internet traffic in North America between 9 p.m. and midnight. Some Tier 1 providers would like to create a high-traffic lane over the Internet for these content providers and charge them accordingly. Others favor a net neutrality approach where all data moving on the Internet is treated equally. Many governments worldwide are becoming involved in how these disputes are regulated and are beginning to favor a net neutral approach that regulates the Internet as a public good like electricity or water and less like a commercial venture.
Difficulty: Easy
AACSB: Information Technology
Chapter LO: 2: How does data move over a network?
Course LO: Compare and contrast different ways of connecting to the Internet

86) Describe the three-tier architecture used in most e-commerce and social media applications.
Answer: Almost all social media apps and e-commerce sites use the three-tier architecture, which is an arrangement of user computers and servers into three categories, or tiers. The user tier consists of computers, smartphones, and other devices that have browsers that request and process Web pages. The server tier is composed of computers that run Web servers and process application programs. The database tier consists of computers that run a database management system (DBMS) that processes requests to retrieve and store data.
Difficulty: Easy
AACSB: Information Technology
Chapter LO: 3: How does a typical Web server move data on a network?
Course LO: Compare and contrast different ways of connecting to the Internet

87) What is a web farm or server farm?
Answer: To ensure acceptable performance, commercial Web sites usually are supported by several or even many Web server computers in a facility called a Web farm or server farm. Work is distributed among the computers in a Web farm to minimize customer delays. The coordination among multiple Web server computers is a fantastic dance, but, alas, we do not have
space to tell that story here. Just imagine the coordination that must occur as you upload a photo, search for another user, or download images.
Difficulty: Easy
AACSB: Information Technology
Chapter LO: 3: How does a typical Web server move data on a network?
Course LO: Compare and contrast different ways of connecting to the Internet

88) What is a login server? What is the role of the DBMS with a log in server?
Answer: A login server is an app program that runs on a server-tier computer. A login server receives requests from users via the Web server, takes some action, and returns a response to the users via the Web server. Typical login server functions are to obtain user names and pass-words and compare them to credentials stored in the database. When you supply your user name and password and click submit, the login server sends your credentials to the DBMS and asks the DBMS to look through the database of accounts to determine if there is a match. If none is found the DBMS will reply to the login server that no match was found; if a match is found the login server will tell the Web server to send you to the page.
Difficulty: Moderate
AACSB: Information Technology
Chapter LO: 3: How does a typical Web server move data on a network?
Course LO: Compare and contrast different ways of connecting to the Internet

89) Explain why the cloud is described as elastic and pooled.
Answer: The term elastic means that the amount of resources leased can be increased or decreased dynamically, programmatically, in a short span of time and that organizations pay for just the resources that they use. The resources are pooled, because many different organizations use the same physical hardware; they share that hardware. Cloud vendors dynamically allocate virtual machines to physical hardware as customer needs increase or decrease.
Difficulty: Moderate
AACSB: Information Technology
Chapter LO: 4: Why is the cloud the future for most organizations?
Course LO: Describe the major types of computer hardware and software used by companies

90) Explain the advantages and disadvantages of cloud-based hosting:
Answer: Advantages are that you can quickly obtain and access a server, often within minutes. In addition, if you need thousands of servers, you can readily scale up to obtain them. Finally, cost structures with cloud-based hosting are usually known. Although you might be surprised how many customers want to access your Web site, you won't have any surprises as to how much it will cost. Another positive is that you'll be receiving best-of-breed security and disaster recovery. In addition, you need not worry that you're investing in technology that will soon be obsolete; the cloud vendor is taking that risk. All of this is possible because the cloud vendor is gaining economies of scale by selling to an entire industry, not just to you. The cloud also has

personnel advantages. The disadvantages are that you are subject to changes in the vendor's management, policy, and prices. Another disadvantage is that disaster and recovery procedures are often difficult to assess.
Difficulty: Moderate
AACSB: Information Technology
Chapter LO: 4: Why is the cloud the future for most organizations?
Course LO: Describe the major types of computer hardware and software used by companies

91) Explain the advantages and disadvantages of in-house hosting:
Answer: The primary advantage of in-house hosting is control of data. You know where your data—which may be a large part of your organization's value—is located. You know how many copies of your data there are, if they are in the same country as you are, and the laws that apply to that data. Disadvantages include having to construct your own data center, you will also need to acquire and train the personnel to run it and then manage those personnel and your facility.
Difficulty: Moderate
AACSB: Information Technology
Chapter LO: 4: Why is the cloud the future for most organizations?
Course LO: Describe the major types of computer hardware and software used by companies

92) What are two factors have made cloud-based hosting advantageous today.
First, processors, data communication, and data storage are so cheap as to be nearly free. At the scale of a Web farm of hundreds of thousands of servers, processing for an hour costs essentially nothing, as the 1.5-cent price per hour indicates. Because data communication is so cheap, getting the data to and from that processor is also nearly free. Second, advances in SOA and protocol adoption have made the cloud even more economical, transparent to the user, and convenient.
Difficulty: Moderate
AACSB: Information Technology
Chapter LO: 4: Why is the cloud the future for most organizations?
Course LO: Describe the major types of computer hardware and software used by companies

93) What is SaaS and provide an example of a company that offers this service:
Answer: An organization that provides software as a service (SaaS) provides not only hardware infrastructure, but also an operating system and app programs on top of that hardware. For example, Salesforce.com provides programs for customer and sales tracking as a service. Similarly, Microsoft provides Office Online and OneDrive as a service. Exchange, Lync, and SharePoint apps are provided as a service "in the cloud."
Difficulty: Easy
AACSB: Information Technology
Chapter LO: 5: What are the typical cloud options?
Course LO: Describe the major types of computer hardware and software used by companies

94) What is PaaS? Provide an example of a company that offers this service:
Answer: The second category of cloud hosting is platform as a service (PaaS), whereby vendors provide hosted computers, an operating system, and possibly a DBMS. Microsoft Windows Azure, for example, provides servers installed with Windows Server. Customers of Windows Azure then add their own apps on top of the hosted platform. Microsoft SQL Azure provides a

host with Windows Server and SQL Server. Oracle On Demand provides a hosted server with Oracle Database. Google offers Google App Engine (GAE) as a PAAS; Snap is using GAE to host its Snapchat app. Again, for PaaS, organizations add their own apps to the host.
Difficulty: Easy
AACSB: Information Technology
Chapter LO: 5: What are the typical cloud options?
Course LO: Describe the major types of computer hardware and software used by companies