

## Chapter 2: Technology Infrastructure: The Internet and the World Wide Web

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### TRUE/FALSE

1. Networks of computers and the Internet that connects them to each other form the basic technological structure that underlies virtually all electronic commerce.

ANS: T                      PTS: 1                      REF: 55

2. The USENET was the earliest of the networks that eventually combined to become what we now call the Internet.

ANS: F                      PTS: 1                      REF: 56

3. E-mail was born in 1972 when a researcher wrote a program that could send and receive messages over the Defense Department network.

ANS: T                      PTS: 1                      REF: 56

4. In 1989, the NSF permitted two commercial e-mail services, MCI Mail and CompuServe, to establish limited connections to the Internet for the sole purpose of exchanging e-mail transmissions with users of the Internet.

ANS: T                      PTS: 1                      REF: 57

5. A network of computers that are located close together—for example, in the same building—is called a local area network.

ANS: T                      PTS: 1                      REF: 58

6. The Internet provides a high degree of security in its basic structure.

ANS: F                      PTS: 1                      REF: 60

7. Although fax, telephone, e-mail, and overnight express carriers have been the main communications tools for business for many years, extranets can replace many of them at a lower cost.

ANS: T                      PTS: 1                      REF: 61

8. An intranet extends beyond the organization that created it.

ANS: F                      PTS: 1                      REF: 61

9. The “virtual” part of VPN means that the connection seems to be a temporary, internal network connection, but the connection is actually permanent.

ANS: F                      PTS: 1                      REF: 61

10. VPN software must be installed on the computers at both ends of the transmission.

ANS: T                      PTS: 1                      REF: 61

11. The technologies used (public networks, private networks, or VPNs) are independent of organizational boundaries.  
ANS: T                   PTS: 1                   REF: 62
12. IP addresses appear as five numbers separated by periods.  
ANS: F                   PTS: 1                   REF: 63
13. SMTP is a common protocol used for sending and retrieving e-mail.  
ANS: T                   PTS: 1                   REF: 65
14. IMAP is a newer e-mail protocol that performs the same basic functions as POP, but includes additional features.  
ANS: T                   PTS: 1                   REF: 65
15. The POP protocol provides support for MIME.  
ANS: T                   PTS: 1                   REF: 65
16. At a technological level, the Web is nothing more than software that runs on computers that are connected to the Internet.  
ANS: T                   PTS: 1                   REF: 66
17. The set of rules for delivering Web page files over the Internet is in a protocol called the Hypertext Transfer Protocol (HTTP).  
ANS: T                   PTS: 1                   REF: 66
18. An HTML document is similar to a word-processing document in that it specifies how a particular text element will appear.  
ANS: F                   PTS: 1                   REF: 67
19. Domain names are sets of words that are assigned to specific IP addresses.  
ANS: T                   PTS: 1                   REF: 69
20. The Internet Corporation for Actualized Names and Nuances has the responsibility of managing domain names and coordinating them with the IP address registrars.  
ANS: F                   PTS: 1                   REF: 69
21. HTML is a meta language because users can create their own markup elements that extend the usefulness of XML.  
ANS: F                   PTS: 1                   REF: 71
22. SGML offers a system of marking up documents that is independent of any software application.  
ANS: T                   PTS: 1                   REF: 72

23. The term cascading is used because designers can apply many style sheets to the same Web page, one on top of the other.

ANS: T                      PTS: 1                      REF: 78

24. The higher the bandwidth, the faster data files travel and the faster Web pages appear on your screen.

ANS: T                      PTS: 1                      REF: 84

25. Asymmetric connections provide the same bandwidth for each direction.

ANS: F                      PTS: 1                      REF: 84

### MULTIPLE CHOICE

1. The combination of telephone lines and the closed switches that connect them to each other is called a \_\_\_\_.

- a. LAN
- b. WAN
- c. circuit
- d. pathway

ANS: C                      PTS: 1                      REF: 58

2. On a packet-switched network, files and e-mail messages are broken down into small pieces, called \_\_\_\_.

- a. messages
- b. pieces
- c. circuits
- d. packets

ANS: D                      PTS: 1                      REF: 59

3. When packets leave a network to travel on the Internet, they must be translated into a standard format. \_\_\_\_ usually perform this translation function.

- a. Switches
- b. Bridges
- c. Routers
- d. Routing algorithms

ANS: C                      PTS: 1                      REF: 59

4. Routers and the telecommunications lines connecting them are collectively referred to as \_\_\_\_.

- a. backbone routers
- b. Internet routers
- c. an asynchronous backbone
- d. the Internet backbone

ANS: D                      PTS: 1                      REF: 60

5. A(n) \_\_\_\_ does not extend beyond the boundaries of a particular organization.

- a. Internet
- b. extranet
- c. intranet
- d. ARPANET

ANS: C                      PTS: 1                      REF: 61

6. A(n) \_\_\_\_ is like a separate, covered commuter lane on a highway (the Internet) in which passengers are protected from being seen by the vehicles traveling in the other lanes.

- a. VPN
- b. IP wrapper
- c. extranet
- d. IAP

ANS: A                      PTS: 1                      REF: 61

7. A(n) \_\_\_\_ is a connection that uses public networks and their protocols to send data in a way that protects the data as well as a private network would, but at a lower cost.
- a. public network
  - b. virtual public network
  - c. virtual private network
  - d. private network

ANS: C                      PTS: 1                      REF: 61

8. A \_\_\_\_ is a collection of rules for formatting, ordering, and error checking data sent across a network.
- a. routing algorithm
  - b. backbone router
  - c. protocol
  - d. packet

ANS: C                      PTS: 1                      REF: 62

9. \_\_\_\_ determine how the sending device indicates that it has finished sending a message, and how the receiving device indicates that it has received the message.
- a. Routers
  - b. Bridges
  - c. Protocols
  - d. Adapters

ANS: C                      PTS: 1                      REF: 62

10. In networking applications, an 8-bit number is often called a(n) \_\_\_\_.
- a. octet
  - b. netbit
  - c. piconet
  - d. bit

ANS: A                      PTS: 1                      REF: 63

11. Network engineers have devised a number of stopgap techniques to stretch the supply of IP addresses. One of the most popular techniques is \_\_\_\_.
- a. subnetting
  - b. subletting
  - c. sub-blocking
  - d. piconetting

ANS: A                      PTS: 1                      REF: 64

12. A computer called a \_\_\_\_ converts private IP addresses into normal IP address when it forwards packets from those computers to the Internet.
- a. routing algorithm device
  - b. network address translation device
  - c. subnet translation device
  - d. private network device

ANS: B                      PTS: 1                      REF: 64

13. The \_\_\_\_ numbering system uses 16 characters.
- a. hexadecimal
  - b. decimal
  - c. binary
  - d. ASCII

ANS: A                      PTS: 1                      REF: 64

14. IPv6 uses a \_\_\_\_ number for addresses.
- a. 32-bit
  - b. 56-bit
  - c. 128-bit
  - d. 256-bit

ANS: C                      PTS: 1                      REF: 64

15. The purpose of a(n) \_\_\_\_ is to respond to requests for Web pages from Web clients.
- a. URL
  - b. e-mail
  - c. Web server
  - d. top-level domain

ANS: C                    PTS: 1                    REF: 65

16. \_\_\_\_ specifies the format of a mail message and describes how mail is to be administered on the e-mail server and transmitted on the Internet.
- a. SMTP
  - b. TCP/IP
  - c. MIME
  - d. POP

ANS: A                    PTS: 1                    REF: 65

17. A newer e-mail protocol that performs the same basic functions as POP, but includes additional features, is known as \_\_\_\_.
- a. IMAP
  - b. SMTP
  - c. POPI
  - d. IPOP

ANS: A                    PTS: 1                    REF: 65

18. \_\_\_\_ lets users create and manipulate e-mail folders and individual e-mail messages while the messages are still on the e-mail server.
- a. POP
  - b. SMTP
  - c. IMAP
  - d. MIME

ANS: C                    PTS: 1                    REF: 65

19. \_\_\_\_ is a set of rules for handling binary files, such as word-processing documents, spreadsheets, photos, or sound clips, that are attached to e-mail messages.
- a. IMAP
  - b. MIME
  - c. SMTP
  - d. POP

ANS: B                    PTS: 1                    REF: 65

20. The combination of the protocol name and the domain name is called the \_\_\_\_.
- a. URT
  - b. URO
  - c. URL
  - d. HTTP

ANS: C                    PTS: 1                    REF: 66

21. HTML was developed by \_\_\_\_.
- a. ARPANET
  - b. NSF
  - c. Ted Nelson
  - d. Tim Berners-Lee

ANS: D                    PTS: 1                    REF: 67

22. \_\_\_\_ was the first Web browser that became widely available for personal computers.
- a. Mosaic
  - b. Netscape
  - c. Internet Explorer
  - d. CompuServe

ANS: A                    PTS: 1                    REF: 67

23. \_\_\_\_ are sets of words that are assigned to specific IP addresses.
- a. Domain names
  - b. URLs
  - c. Octets
  - d. Piconets

ANS: A                    PTS: 1                    REF: 69

24. The early versions of \_\_\_\_ let Web page designers create text-based electronic documents with headings, title bar titles, bullets, lines, and ordered lists.

- a. HTTP
- b. HTML
- c. SGML
- d. XML

ANS: B                      PTS: 1                      REF: 72

25. In HTML, hyperlinks are created using the HTML \_\_\_\_ tag.
- a. head
  - b. anchor
  - c. title
  - d. ol

ANS: B                      PTS: 1                      REF: 77

**COMPLETION**

1. A computer \_\_\_\_\_ is any technology that allows people to connect computers to each computer.

ANS: network

PTS: 1                      REF: 55

2. A network which uses a specific set of rules and connects networks all over the world to each other, is called the \_\_\_\_\_.

ANS: Internet

PTS: 1                      REF: 55

3. The part of the Internet known as the \_\_\_\_\_ is a subset of the computers on the Internet that are connected to one other in a specific way that makes them and their contents easily accessible to each other.

ANS:  
World Wide Web  
WWW  
Web  
WWW (World Wide Web)  
World Wide Web (WWW)

PTS: 1                      REF: 55

4. A(n) \_\_\_\_\_ is an e-mail address that forwards any message it receives to any user subscribed to the list.

ANS: mailing list

PTS: 1                      REF: 56

5. In 1979, a group of students and programmers at Duke University and the University of North Carolina started \_\_\_\_\_, which allows anyone who connects to the network to read and post articles on a variety of subjects.

ANS:  
Usenet  
User's News Network

PTS: 1                    REF: 56

6. Usenet survives on the Internet today, with more than 1000 different topic areas that are called \_\_\_\_\_.

ANS: newsgroups

PTS: 1                    REF: 56

7. Internet \_\_\_\_\_ are computers that are directly connected to the Internet.

ANS: hosts

PTS: 1                    REF: 57

8. \_\_\_\_\_ providers sell Internet access rights directly to larger customers and indirectly to smaller firms and individuals through other companies, called ISPs.

ANS: Network access

PTS: 1                    REF: 57

9. Programs apply their routing algorithms to information they have stored in routing tables or \_\_\_\_\_ tables.

ANS: configuration

PTS: 1                    REF: 59

10. The routers connected to the Internet backbone are sometimes called \_\_\_\_\_ routers.

ANS: backbone

PTS: 1                    REF: 60

11. A(n) \_\_\_\_\_ is any computer network or telecommunications network that is available to the public.

ANS: public network

PTS: 1                    REF: 60

12. A(n) \_\_\_\_\_ is used when the internet extends beyond the boundaries of an organization.

ANS: extranet

PTS: 1                    REF: 61-62

13. The \_\_\_\_\_ Protocol controls the disassembly of a message or a file into packets before it is transmitted over the Internet, and it controls the reassembly of those packets into their original formats when they reach their destinations.

ANS: Transmission Control

PTS: 1 REF: 62

14. The \_\_\_\_\_ Protocol specifies the addressing details for each packet, labeling each with the packet's origination and destination addresses.

ANS: Internet

PTS: 1 REF: 62-63

15. The set of rules for delivering Web page files over the Internet is in a protocol called the \_\_\_\_\_.

ANS:

Hypertext Transfer Protocol

Hypertext Transfer Protocol (HTTP)

HTTP

HTTP (Hypertext Transfer Protocol)

PTS: 1 REF: 66

16. A(n) \_\_\_\_\_ server is a computer that stores files written in Hypertext Markup Language (HTML).

ANS: hypertext

PTS: 1 REF: 67

17. A(n) \_\_\_\_\_ is a language that can be used to define other languages.

ANS: metalanguage

PTS: 1 REF: 71

18. HTML, XML, and XHTML have descended from the original \_\_\_\_\_ specification.

ANS:

SGML

Standard Generalized Markup Language

SGML (Standard Generalized Markup Language)

Standard Generalized Markup Language (SGML)

PTS: 1 REF: 71

19. In HTML, the text elements that are related to each another are called \_\_\_\_\_ elements.

ANS: hypertext

PTS: 1 REF: 72

20. A(n) \_\_\_\_\_ hyperlink structure resembles conventional paper documents in that the reader begins on the first page and clicks a Next button to move to the next page in a serial fashion.

ANS: linear

PTS: 1 REF: 76

21. \_\_\_\_\_ let designers define formatting styles that can be applied to multiple Web pages.

ANS:

Cascading Style Sheets

CSS

CSS (Cascading Style Sheets)

Cascading Style Sheets (CSS)

PTS: 1 REF: 78

22. An XML document is embedded within the \_\_\_\_\_ document.

ANS:

HTML

Hypertext Markup Language

HTML (Hypertext Markup Language)

Hypertext Markup Language (HTML)

PTS: 1 REF: 78

23. \_\_\_\_\_ tags do not specify how text appears on a Web page; the tags convey the meaning (the semantics) of the information included within them.

ANS:

Extensible Markup Language

XML

XML (Extensible Markup Language)

Extensible Markup Language (XML)

PTS: 1 REF: 81

24. \_\_\_\_\_ is the amount of data that can travel through a communication medium per unit of time.

ANS: Bandwidth

PTS: 1 REF: 84

25. Upstream bandwidth is also called \_\_\_\_\_ bandwidth.

ANS: upload

PTS: 1 REF: 84

## ESSAY

1. As an individual packet travels from one network to another, the computers through which the packet travels determine the best route for getting the packet to its destination. Describe this process.

ANS:

The computers that decide how to best forward each packet are called routing computers, router computers, routers, gateway computers (because they act as the gateway from a LAN or WAN to the Internet) or border routers (because they are located at the border between the organization and the Internet.) The programs on the routers that determine the best path contain rules called routing algorithms. The programs apply these algorithms to information they have stored in routing tables or configuration tables. This information includes lists of connections that lead to particular groups of other routers, rules that specify which connection to use first, and rules for handling instances of heavy packet traffic and network congestion.

PTS: 1                    REF: 59

2. What is the difference between a public network and a private network?

ANS:

A public network is any computer network or telecommunications network that is available to the public. The Internet is one example of a public network. A private network is a private, leased-line connection between two companies that physically connects their intranets to one another.

PTS: 1                    REF: 60

3. Identify the four key rules for message handling.

ANS:

The open architecture philosophy developed for the evolving ARPANET, which later became the core of the Internet, included the use of a common protocol for all computers connected to the Internet and four key rules for message handling: 1) Independent networks should not require any internal changes to be connected to the network, 2) Packets that do not arrive at their destinations must be retransmitted from their source network, 3) Router computers act as receive-and-forward devices; they do not retain information about the packets that they handle, and 4) No global control exists over the network.

PTS: 1                    REF: 62

4. What is the difference between TCP and IP?

ANS:

The TCP controls the disassembly of a message or a file into packets before it is transmitted over the Internet, and it controls the reassembly of those packets into their original formats when they reach their destinations. The IP specifies the addressing details for each packet, labeling each with the packet's origination and destination addresses.

PTS: 1                    REF: 62-63

5. What are the advantages of Bluetooth technology?

ANS:

One major advantage of Bluetooth technology is that it consumes very little power, which is an important consideration for many devices. Another advantage is that Bluetooth devices can discover each other and exchange information automatically. For example, a person using a laptop computer in a temporary office can print to a local Bluetooth-enabled printer without logging in to the network or installing software in either device. The printer and laptop computer electronically recognize each other as Bluetooth devices and immediately can begin exchanging information.

PTS: 1

REF: 88