**Chapter 1**

1. Identify the five components of a data communications system.

2. What are the three criteria necessary for an effective and efficient network?

3. What are the advantages of a multipoint connection over a point-to-point connection?

4. What are the two types of line configuration?

5. Categorize the four basic topologies in terms of line configuration.

6. What is the difference between half-duplex and full-duplex transmission modes?

7. Name the four basic network topologies, and cite an advantage of each type.

8. For n devices in a network, what is the number of cable links required for a mesh, ring, bus, and star topology?

9. What are some of the factors that determine whether a communication system is a LAN or WAN?

10. What is an internet? What is the Extranet and Intranet?

11. Why are protocols and standard are needed?

12. What is the maximum number of characters or symbols that can be represented by Unicode?

13. A color image uses 16 bits to represent a pixel. What is the maximum number of different colors that can be represented?

14. Assume six devices are arranged in a mesh topology. How many cables are needed? How many ports are needed for each device?

15. For each of the following four networks, discuss the consequences if a connection fails.

a. Five devices arranged in a mesh topology

b. Five devices arranged in a star topology (not counting the hub)

c. Five devices arranged in a bus topology

d. Five devices arranged in a ring topology

16. You have two computers connected by an Ethernet hub at home. Is this a LAN, a MAN, or a WAN? Explain your reason.

17. Draw a hybrid topology with a star backbone and three ring networks.

18. Draw a hybrid topology with a ring backbone and two bus networks.

19. Performance is inversely related to delay. When you use the Internet, which of the

following applications are more sensitive to delay?

a. Sending an e-mail

b. Copying a file

c. Surfing the Internet

20. When a party makes a local telephone call to another party, is this a point-to-point

or multipoint connection? Explain your answer.

**Chapter 2**

1. List the layers of the Internet model, its responsibilities and characteristics.

2. Which layers in the Internet model are the network support layers?

3. Which layer in the Internet model is the user support layer?

4. What is the difference between network layer delivery and transport layer delivery?

5. What is a peer-to-peer process and How does information get passed from one layer to the next in the Internet model?

6. What are headers and trailers, and how do they get added and removed?

7. What is the difference between a port address, a logical address, and a physical

address?

8. How do the layers of the Internet model correlate to the layers of the OSI model?

Exercises

9. How are OSI and ISO related to each other?

10. Match the following to one or more layers of the OSI model:

a. Route determination

b. Flow control

c. Interface to transmission media

d. Provides access for the end user

11. Match the following to one or more layers of the OSI model:

a. Reliable process-to-process message delivery

b. Route selection

c. Defines frames

d. Provides user services such as e-mail and file transfer

e. Transmission of bit stream across physical medium

12. Match the following to one or more layers of the OSl model:

a. Communicates directly with user's application program

b. Error correction and retransmission

c. Mechanical, electrical, and functional interface

d. Responsibility for carrying frames between adjacent nodes

13. Match the following to one or more layers of the OSI model:

a. Format and code conversion services

b. Establishes, manages, and terminates sessions

c. Ensures reliable transmission of data

d. Log-in and log-out procedures

e. Provides independence from differences in data representation

14. In Figure, computer A sends a message to computer D via LANl, router Rl, and LAN2. Show the contents of the packets and frames at the network and data link layer for each hop interface.

15. Give some advantages and disadvantages of combining the session, presentation, and application layer in the OSI model into one single application layer in the Internet model.