

# Chapter 1 Solutions

## Review Questions

1. Which of the following best describes the Presentation layer?
  - a. Establishes, maintains, and manages sessions between applications
  - b. Translates, encrypts, or prepares data from the Application layer for network transmission**
  - c. Handles routing information for data packets
  - d. Provides the electrical and mechanical transmission of data
  - e. Handles link control and uses the MAC address on the network interface card (NIC)
2. Which of the following best describes the Network layer?
  - a. Handles routing information for data packets**
  - b. Provides the electrical and mechanical transmission of data
  - c. Handles link control and uses the MAC address on the NIC
  - d. Establishes, maintains, and manages sessions between applications
  - e. Translates, encrypts, or prepares data from the Application layer for network transmission
3. Which of the following best describes the Session layer?
  - a. Translates, encrypts, or prepares data from the Application layer for network transmission
  - b. Handles routing information for data packets
  - c. Provides the electrical and mechanical transmission of data
  - d. Handles link control and uses the MAC address on the NIC
  - e. Establishes, maintains, and manages sessions between applications**
4. Which of the following best describes the Transport layer?
  - a. Provides the electrical and mechanical transmission of data
  - b. Handles link control and uses the MAC address on the NIC
  - c. Establishes, maintains, and manages sessions between applications
  - d. Segments and reassembles data and provides either connection-oriented or connectionless communications**
  - e. Translates, encrypts, or prepares data from the Application layer for network transmission
5. Which of the following best describes the Data Link layer?
  - a. Provides the electrical and mechanical transmission of data
  - b. Handles link control and uses the MAC address on the NIC**
  - c. Establishes, maintains, and manages sessions between applications
  - d. Translates, encrypts, or prepares data from the Application layer for network transmission
  - e. Handles routing information for data packets
6. Which of the following best describes the Physical layer?
  - a. Establishes, maintains, and manages sessions between applications
  - b. Translates, encrypts, or prepares data from the Application layer for network transmission
  - c. Provides the electrical and mechanical transmission of data**
  - d. Handles link control and uses the MAC address on the NIC
  - e. Provides network services to the user
7. Which of the following best describes the Application layer?
  - a. Establishes, maintains, and manages sessions between applications
  - b. Translates, encrypts, or prepares data for network transmission
  - c. Provides network services to the user**
  - d. Handles routing information for data packets
  - e. Provides the electrical and mechanical transmission of data
8. Which of the following accurately describe the Media Access Control (MAC) address? (Choose all that apply.)
  - a. It is a physical number set during the manufacturing process.**
  - b. This address is a layer in a network segment.
  - c. MAC addresses contain 12 hexadecimal numbers.**

**d. Computers use this address to uniquely identify themselves on the network.**

e. An IP address is one example of this type of address.

9. Which of the following accurately describe the network address? (Choose all that apply.)

a. It is a physical number set during the manufacturing process.

**b. This address is used when routing communications between different network segments.**

c. The Data Link layer uses this address.

**d. This address is set at layer 3 of the OSI model.**

**e. An example of this type of address is an IP address.**

10. Connection-oriented services are also known as \_\_\_\_\_ services.

**a. reliable**

b. unreliable

c. datagram

11. Connectionless services are also called \_\_\_\_\_ services.

a. reliable

b. acknowledgment

**c. unreliable**

12. Which of the following services receive an acknowledgment from the destination? (Choose all that apply.)

a. Datagram

**b. Reliable**

**c. Connection-oriented**

d. Connectionless

e. Unreliable

13. Place the following steps of data encapsulation in their correct descending order:

a. Frame headers and trailers added

b. Segment header added

c. Bit transmission

d. Packet creation and network header

e. Data conversion

**The correct order is e, b, d, a, c.**

14. Which of the following correctly defines a WAN?

a. A network contained within a single geographic location and usually connected by a privately maintained medium

**b. A network spread over multiple geographic areas and usually connected by publicly and privately maintained media**

c. A network spread over a single metropolitan area

15. Which of the following best describes a LAN?

**a. A network that is contained in a single geographic area such as a building or floor in a building**

b. A countywide network that spans multiple geographic locations

c. A large network that is connected by both publicly and privately maintained cabling spread over multiple geographic regions

16. Which of the following reasons for providing a layered OSI architecture are correct? (Choose all that apply.)

**a. To provide design modularity, which allows upgrades to a specific layer to remain separate from the other layers**

b. To simplify the networking model by dividing it into 14 layers and 12 sublayers

c. To discourage interoperability between disparate networking models

**d. To enable programmers to specialize in a particular layer**

**e. To allow for standardized interfaces from networking vendors**

17. On a network, computers must use a common \_\_\_\_\_ in order for communication to occur.

**a. protocol**

- b. operating system
- c. manufacturer
- d. hardware platform

18. Before networks, what did people use to transfer files?

**a. Sneakernet**

- b. Protocols
- c. Interface cards
- d. Ethernet

19. A protocol is to a computer as a(n) \_\_\_\_\_ is to a person.

- a. identity
- b. personality
- c. language**
- d. personal philosophy

20. Which of the following are network hardware? (Choose all that apply.)

- a. NIC**
- b. NOS
- c. LLC
- d. Network media**
- e. Connectors**

21. Which of the following are network software? (Choose all that apply.)

- a. Components that map to the Application layer of the OSI model**
- b. NIC
- c. NOS**
- d. Media connectors

22. All networking vendors follow the OSI model and design seven-layer architectures. True or **False**?

23. Communications on a network originate at the \_\_\_\_\_.

- a. destination
- b. breaker
- c. peak
- d. source**

24. Transmitted signals are bound for a \_\_\_\_\_ computer.

- a. destination**
- b. breaker
- c. peak
- d. source

25. Information transmitted on a network is called a(n) \_\_\_\_\_.

- a. package
- b. expresser
- c. data destination
- d. data packet**
- e. E-pack

26. Which of the following are layers of the OSI model? (Choose all that apply.)

- a. OSI
- b. Physical**
- c. IEEE
- d. Data Link**

27. Which layer of the OSI model is responsible for media access and packaging data into frames?

- a. Network layer
- b. Physical layer
- c. Data Link layer**

d. Transport layer

28. At which layer of the OSI model will encryption and compression occur?

**a. Presentation layer**

b. Session layer

c. Application layer

d. Network layer

29. Which of the following lists the layers of the OSI model from layer 7 to layer 1?

a. Application, Session, Transport, Network, Presentation, Data Link, Physical

b. Physical, Data Link, Network, Transport, Session, Presentation, Application

**c. Application, Presentation, Session, Transport, Network, Data Link, Physical**

d. Presentation, Application, Session, Network, Transport, Data Link, Physical

30. The \_\_\_\_\_ layer is responsible for finding the best path to route packets within an internetwork.

a. Transport

**b. Network**

c. Session

d. Data Link

## Case Projects

### Case Project 1

Moe may not realize that without using the OSI reference model as a discussion tool, he probably could not have learned enough about protocols to pass the Network+ exam. Learning about network operation without this frame of reference would be nearly impossible. Also, this knowledge often helps in troubleshooting the network. If something goes wrong on the network, understanding the layer at which the nonfunctioning element is associated can help you solve the problem.

### Case Project 2

Although data encapsulation is often described in terms of the application, transport, network, data link, and physical layers, it can actually occur at all layers. Encapsulation is the process of wrapping the header information from the higher layer with the header of the next-lower layer. The five steps of data encapsulation are:

i) data conversion at the upper layers (5,6,7)

ii) segmentation at layer 4

iii) packet creation at layer 3

iv) frame encapsulates packet at layer 2

v) bit transmission at layer 1

### Case Project 3

The data link layer controls access to the physical media, however, it is not part of the physical layer. This is especially confusing since the MAC address is also known as the hardware or physical address. The MAC address is called the hardware or physical address because it is burned onto the NIC and cannot be changed. The only way to change the MAC address of a device is to change the NIC card in the device. The MAC address is more specifically operating at the MAC sublayer of the data link layer. There is also the logical link control (LLC) sublayer in the data link layer. The LLC is concerned with the linking function between the lower layers and upper layer protocols.

### Case Project 4

From 1 to 7: "Please do not throw sausage pizza away."

From 7 to 1: "All people seem to need data processing."

Physical: encoding, bit transmission, signal

Data Link: frame, MAC address, access method

Network: packet, routing, best path

Transport: segmentation, connection-oriented vs. connectionless, error-free delivery

Session: synchronization, half-duplex/full duplex, communications setup and teardown

Presentation: formatting, compression, encryption

Application: user/application services, communications origination, FTP/Telnet

**Case Project 5**

Students could draw two OSI models side by side. An arrow could come down from the top of the first model (source) to the physical layer and then back up the second model (destination) to the application layer. In some way it could be illustrated that the data "grows" as it is encapsulated with information with each successive layer as it goes down the first stack. Then, the headers are stripped off one by one as the data travels up the second (destination) stack until it reaches the user on top of the second model.