***Digital Business Networks* (Dooley)**
Chapter 2 Networking Models: OSI and TCP/IP

Multiple Choice Questions

1) In order to get a computer's data from point A to point B, an_____must be used.
A) ARP
B) infrastructure
C) Interpol
D) Internet subnet mask
Answer: B
Diff: 1 Page Ref: 16

2) Physical and logical components within the network work with each other based on standards and_____.
A) protocols
B) projects
C) guesses
D) projections
Answer: A
Diff: 3 Page Ref: 16

3) Above and beyond their standards and protocols, networks have another dimension that describes how they function. This extra dimension is the_____upon which the network is based.
A) logical component
B) standard procedure
C) networking model
D) none of the above
Answer: C

Diff: 3 Page Ref: 16

4) A networking model is akin to a(n):
A) architectural blueprint
B) compass rose

C) divining stick
D) none of the above
Answer: A
Diff: 2 Page Ref: 16

5) Networking models are_____.
A) concrete
B) conceptual
C) unable to be duplicated
D) not able to be modified
Answer: B
Diff: 2 Page Ref: 17

6) Open standards are:
A) available for public comment, review, and varying implementation
B) unavailable to the public
C) subject to Freedom of Information Act requests
D) a thing of the past
Answer: A
Diff: 2 Page Ref: 17

7) Data communication networking models that have won wide acceptance include:
A) OSI
B) TCP/IP
C) All of the above
D) None of the above
Answer: C
Diff: 2 Page Ref: 17

8) The_____model has become the model of choice throughout the world not only for wide area networks (WANs), but also for metropolitan area networks (MANs), local area networks (LANs) and backbone networks (BNs).
A) TCP/IP
B) EMP
C) OSI
D) R2D2
Answer: A
Diff: 2 Page Ref: 17

9) A layered architecture is_____to a data communication network model.
A) insignificant
B) advantageous
C) incompatible
D) incongruent
Answer: B
Diff: 2 Page Ref: 17

10) The Open Systems Interconnection (OSI) model has _____layer(s).
A) one
B) three
C) five
D) seven
Answer: D
Diff: 2 Page Ref: 17

11) What are the seven layers of the Open Systems Interconnection (OSI) model?
A) Readiness, power, venue, markup, transmission, reception, end
B) Start, process, link, adapt, measure, synchronize, end
C) Physical, data link, network, transport, application, presentation, session
D) Identification, reaction, initiation, transmittal, analysis, synergization, conclusion
Answer: C
Diff: 2 Page Ref: 18

12) Three key services provided at the application layer include: (1) synchronizing the services between a user application and the protocol(s) it may use, (2) ensuring that necessary resources required by an application service are available, and (3)_____.
A) making sure that end users are receptive
B) making sure that the application is licensed
C) making sure that email is properly set up
D) making sure that the correct communication protocol or service is available to the application
Answer: D
Diff: 2 Page Ref: 18

13) Some of the services provided at the application layer of the OSI model might include:
A) e-mail
B) remote file access and transfer
C) e-printing services
D) all of the above
Answer: D
Diff: 2 Page Ref: 18

14) Data have to be encoded into some_____form so that the data can be used by computer systems.
A) secondary
B) tertiary
C) bipolar
D) binary
Answer: D
Diff: 2 Page Ref: 19

15) Which layer in an OSI data communication networking model ensures that data passed up to the application layer is in a format understandable to that layer?
A) application layer
B) presentation layer
C) transport layer
D) network layer
Answer: B
Diff: 2 Page Ref: 19

16) Which layer in an OSI data communication networking model is responsible for establishing, maintaining, and terminating communications running between processes and applications across the network?
A) application layer
B) session layer
C) presentation layer
D) network layer
Answer: B
Diff: 2 Page Ref: 19

17) Which layer in an OSI data communication networking model ensures that the entire message sent from a sender to a receiver has been delivered?
A) session layer
B) presentation layer
C) transport layer
D) network layer
Answer: C
Diff: 2 Page Ref: 19

18) The_____layer of the OSI data communication networking model takes unpackaged bit stream data arriving from the physical layer and packages the bits into units called frames and then attaches a physical address to each frame.
A) data link
B) beta link
C) transport link
D) communication link
Answer: A
Diff: 2 Page Ref: 19

19) The physical layer of the OSI data communication networking model is responsible for the _____of bits, line configuration, physical topology, and the transmission mode.
A) eradication
B) coordination
C) conjunction
D) synchronization
Answer: D
Diff: 2 Page Ref: 20

20) One governmental body that sets forth building regulations and safety standards is:
A) FDIC
B) OSHA
C) OSBA
D) FDCPA
Answer: B
Diff: 2 Page Ref: 20

21) A significant difference between TCP/IP and OSI is that:
A) several of the protocols associated with TCP/IP are relatively independent of the layer that they are generally associated with whereas, with OSI, protocol functions are dependent to the layer they are associated with
B) several of the protocols associated with OSI are relatively independent of the layer that they are generally associated with whereas, with TCP/IP protocol functions are dependent to the layer they are associated with
C) both A and B
D) neither A nor B
Answer: A
Diff: 2 Page Ref: 21

22) When was the TCP/IP model developed?
A) at the same time as the OSI model
B) after the OSI model
C) before the OSI model
D) by accident when the OSI model was being developed
Answer: C
Diff: 2 Page Ref: 21

23) What is one thing that the TCP/IP model and the OSI model have in common?
A) They are both layered models.
B) They both have lateral sub-models.
C) They both have identical layers.
D) They were both created by OSHA.
Answer: A
Diff: 2 Page Ref: 21

24) IP stands for:
A) Internet productivity
B) International protocol
C) Intransient properties
D) Internet protocol
Answer: D
Diff: 2 Page Ref: 22

25) ARP stands for:
A) Address Resolution Protocol
B) Advanced Reconnection Procedure
C) Acquiring Resonance Pattern
D) Associative Receiving Participle
Answer: A
Diff: 2 Page Ref: 22

26) RARP stands for:
A) Reverse Address Resolution Protocol
B) Rearing Adverse Resolution Practice
C) Revolving Address Resolution Protocol
D) Resolution And Reversion Protocol
Answer: A
Diff: 2 Page Ref: 22

27) IGMP stands for:
A) Indeterminate Group Management Processes
B) International Group Management Protocol
C) Internet Group Message Protocol
D) Internet Generic Message Protocol
Answer: C
Diff: 2 Page Ref: 22

28) ICMP stands for:
A) Internet Control Message Protocol
B) Internal Control Mechanism Procedures
C) Indeterminate Control Messaging Procedures
D) Internal Climate Message Protocol
Answer: A
Diff: 2 Page Ref: 22

29) IP is used at the network layer to send units of data called_____from one network to the next.
A) fledglings
B) datagrams
C) widgets
D) netgrams
Answer: B
Diff: 2 Page Ref: 22

30) As in the OSI model, the data link layer in the TCP/IP model is responsible for moving data from one_____to the next in the network path from the sender to the receiver.
A) database
B) host
C) datagram
D) laptop
Answer: B
Diff: 2 Page Ref: 22

31) Some of the questions a networking technologist might ask when setting up a network would include:
A) What is the purpose of the network? What services will this network be expected to provide?
B) What types of connectivity, 10 people or 100,000, are required? What are the physical dimensions the network?
C) Is the network limited to the size of a room or the expanse of a country? What type of business and user applications will this network have to support?
D) All of the above.
Answer: D
Diff: 1 Page Ref: 22

32) A network can fall into one of four categories. What are the categories?
A) local area network; backbone network; metropolitan area network; wide area network
B) LAN, BN, MAN, WAN
C) either A or B
D) none of the above
Answer: C
Diff: 3 Page Ref: 23

33) The distinction between where one category of network begins and another ends is:
A) crystal clear
B) sometimes blurry
C) impossible
D) never an issue
Answer: B
Diff: 2 Page Ref: 23

34) The FCC and state public utility commissions do NOT regulate which type of networks?
A) WAN
B) BN
C) MAN
D) LAN
Answer: D
Diff: 2 Page Ref: 23

35) Which of the following statements is the most accurate?
A) A LAN would never be found in a work environment.
B) A LAN is always configured in the same way.
C) A LAN is the same thing as a BN.
D) A LAN may include printers and routers.
Answer: D
Diff: 2 Page Ref: 23

36) The networks of the enterprise are typically connected through which kind of network?
A) BN
B) WAN
C) LAN
D) MAN
Answer: A
Diff: 1 Page Ref: 23

37) Organizations that have more than one LAN might be tempted to_____.
A) connect the networks through a backbone network
B) use a backbone network to allow the LAN networks to communicate with each other
C) connect the networks to share resources
D) all of the above
Answer: D
Diff: 2 Page Ref: 23

38) Which of the following statements is the most accurate?
A) An organization can use a LAN to cover greater distances at higher data rates than those offered by a MAN.
B) A LAN can be used to connect BNs and WANs.
C) An organization may find, if justified by transmission-volume needs, that having a private MAN may be less expensive than leasing these services from a local telecommunications company.
D) A MAN is never subject to federal and state regulations.
Answer: C
Diff: 2 Page Ref: 24

39) What is the best description of a "cloud" in networking terms?
A) the inner workings of the infrastructure, the details that are hidden from the user
B) the organization that owns a network
C) a fluffy, beautiful object floating in a blue sky
D) the parent company of a networking company
Answer: A
Diff: 2 Page Ref: 25

40) Which of the following will commonly use circuits provided by common carriers?
A) MAN
B) WAN
C) LAN
D) BN
Answer: B
Diff: 2 Page Ref: 25

41) Sprint, MCI, AT&T and others are all examples of what kind of organizations?
A) common law companies
B) common networkers
C) common telecommuters
D) common carriers
Answer: D
Diff: 2 Page Ref: 25

42) Which statement is most accurate?
A) Many MAN and WAN infrastructure users simply lease the right to use the infrastructure.
B) MAN and WAN infrastructures are always owned by end-users.
C) MAN and WAN infrastructure users are prohibited from leasing such infrastructures.
D) LAN infrastructure users always lease such infrastructures.
Answer: A
Diff: 2 Page Ref: 25

43) The infrastructures that create and support a WAN are_____regulated.
A) heavily
B) never
C) rarely
D) sometimes
Answer: A
Diff: 2 Page Ref: 25

44) Networks have both physical and logical components. These include _____and _____.
A) RAM, CPU
B) hard drives, external drives
C) hosts, external sites
D) hardware, software
Answer: D
Diff: 2 Page Ref: 26

45) In the 7-layered OSI model of architecture, layer 3 would be required to communicate with which of the following layers?
A) 1, 2, 3 only
B) 1, 2 only
C) 2, 4 only
D) 4 and above
Answer: C
Diff: 2 Page Ref: 29

46) If an employee used a file transfer protocol program to send a large report file, the user interface in the file transfer program would serve as the_____layer that permits two people to exchange the data file over the network.
A) presentation
B) transfer
C) application
D) session
Answer: C
Diff: 2 Page Ref: 30

47) When data travels through the layers of a networking model, it is most akin to_____.
A) an envelope that gets stamped along the way
B) a book that has chapters added
C) an onion that loses its layers
D) a roof that has shingles added
Answer: A
Diff: 2 Page Ref: 30

48) The top four "end-to-end" layers under the OSI model are:
A) link, letter, presenting, and final
B) interior, exterior, anterior, and posterior
C) transfer, transmit, user, and end
D) application, presentation, session, and transport
Answer: D
Diff: 2 Page Ref: 29

49) The three lower layers under the OSI model are:
A) application, presentation, session
B) network, data link, physical
C) transfer, transmit, user
D) link, presenting, final
Answer: B
Diff: 2 Page Ref: 29

50) How do OSI layers help a document in a Chicago workstation get to a workstation in Denver?
A) OSI provides the authority for the file transfer.
B) The layers ensure confidentiality as the file is sent.
C) The layers provide the cloud that will allow the file transfer.
D) The layer protocol takes over at each step, down the layers, and each layer envelopes and adds its own stamp or header.
Answer: D
Diff: 2 Page Ref: 30

True/False Questions

1) An infrastructure is like a highway that provides a means of transporting goods from one city to another.
Answer: TRUE
Diff: 3 Page Ref: 16

2) Open architecture models share similar advantages to open standards in that they are unavailable for public comment, review, and varying implementations.
Answer: FALSE
Diff: 3 Page Ref: 16

3) If you have ever used a bank's automated teller machine (ATM), paid for gasoline at an automated gas pump using a charge card, made an airline reservation over the phone, paid a restaurant check using a credit card, or surfed the World Wide Web, then you have used a data communications network that is based on either the Open Systems Interconnection (OSI) or the Transmission Control Protocol/Internet Protocol (TCP/IP).
Answer: TRUE
Diff: 3 Page Ref: 17

4) The ISO developed the Open Systems Interconnection (OSI) model.
Answer: TRUE
Diff: 3 Page Ref: 18

5) A good way to remember a layer stack (or protocol stack) is: All People Seem To Need Digital Power.
Answer: TRUE
Diff: 3 Page Ref: 18

6) Three key services provided at the application layer of the OSI model include: (1) synchronizing the services between a user application and the protocol(s) it may use, (2) ensuring that necessary resources required by an application service are available, and (3) making sure that the correct communication protocol or service is available to the application.
Answer: TRUE
Diff: 3 Page Ref: 18

7) E-mail, remote file access and transfer, printing services, various messaging services, and shared database management are all services supported at the data link layer of the OSI model.
Answer: FALSE
Diff: 3 Page Ref: 18

8) The presentation layer is responsible for the interoperability between a sender and receiver who might be using different encoding schemes.
Answer: TRUE
Diff: 3 Page Ref: 19

9) Compression occurs at the receiver's end and increases the number of bits to be transmitted based on some type of compression scheme.
Answer: FALSE
Diff: 3 Page Ref: 19

10) The session layer is responsible for establishing, maintaining, and terminating communications running between processes or applications across the network.
Answer: TRUE
Diff: 3 Page Ref: 19

11) Data does not have to be encoded into some binary form in order to be used by computer systems.
Answer: FALSE
Diff: 3 Page Ref: 19

12) The transport layer ensures that the entire message sent from a sender to a receiver has been delivered.
Answer: TRUE
Diff: 3 Page Ref: 19

13) Whereas the transport layer in the OSI model is responsible for determining if the entire message has been delivered, the network layer is concerned about the delivery of individual packets across network links.
Answer: TRUE
Diff: 3 Page Ref: 19

14) Something that is "logical," as in a logical address, cannot be changed or modified. Something that is "physical," as in a physical address, is fixed, or set, and can be changed.
Answer: FALSE
Diff: 3 Page Ref: 19

15) Whereas the network layer in the OSI model provides for logical addressing, the data link layer provides for physical addressing.
Answer: TRUE
Diff: 3 Page Ref: 19

16) OSHA stands for the U.S. Department of Labor's Occupational Safety and Health Administration.
Answer: TRUE
Diff: 3 Page Ref: 20

17) Many OSHA regulations and standards cover wiring methods, components, and how and where equipment is deployed.
Answer: TRUE
Diff: 3 Page Ref: 20

18) Many of the courses on network wiring completed by networking technologists have an ethics component.
Answer: TRUE
Diff: 3 Page Ref: 20

19) TCP/IP stands for Transporting Computer Protocol/Internet Protocol.
Answer: FALSE
Diff: 3 Page Ref: 21

20) TCP/IP is known as having either a four- or five-layer model.
Answer: TRUE
Diff: 3 Page Ref: 21

21) The layers of the OSI and TCP/IP models do not have many of the same functionalities.
Answer: FALSE
Diff: 3 Page Ref: 21

22) The application layer of TCP/IP includes the functionalities of the OSI application, presentation, and session layers.
Answer: TRUE
Diff: 3 Page Ref: 21

23) In TCP/IP, the application layer is also sometimes referred to as the process layer because this is where a protocol stack interfaces with processes on a host machine, enabling that host to communicate across the network.
Answer: TRUE
Diff: 3 Page Ref: 21

24) The transport layer of the TCP/IP model has two key protocols that are identified with it: TCP (Transmission Control Protocol) and UDP (User Datagram Protocol).
Answer: TRUE
Diff: 3 Page Ref: 21

25) The network layer of TCP/IP supports IP, or Internet Protocol.
Answer: TRUE
Diff: 3 Page Ref: 21

26) IP is an "unreliable" and "connectionless" protocol because it is bad or weak.
Answer: FALSE
Diff: 3 Page Ref: 21

27) The four protocols associated with the IP protocol are: the Address Resolution Protocol (ARP), the Reverse Address Resolution Protocol (RARP), the Internet Control Message Protocol (ICMP), and the Internet Group Message Protocol (IGMP).
Answer: TRUE
Diff: 3 Page Ref: 22

28) Both the TCP/IP model and the OSI model have the physical layer, but the physical layer is vastly different in each model.
Answer: FALSE
Diff: 3 Page Ref: 22

29) A network will fall within one of the following four categories: local area network, backbone network, metropolitan area network, wide area network.
Answer: TRUE
Diff: 3 Page Ref: 23

30) A LAN is usually the most expensive of networks to set up.
Answer: FALSE
Diff: 3 Page Ref: 23

31) Because LANs typically cross public thoroughfares or property, they are regulated by the FCC or state public utility commissions.
Answer: FALSE
Diff: 3 Page Ref: 23

32) A LAN might include devices such as printers, microcomputers, workstations, servers, hubs, bridges, and routers.
Answer: TRUE
Diff: 3 Page Ref: 23

33) An organization must have no more than one LAN.
Answer: FALSE
Diff: 3 Page Ref: 23

34) All of the networks that belong to one organization are collectively called the enterprise.
Answer: TRUE
Diff: 3 Page Ref: 23

35) A backbone network is usually a high-speed circuit that connects all of the networks within the enterprise, allowing them to communicate with each other.
Answer: TRUE
Diff: 3 Page Ref: 23

36) A business cannot have both a local area network and a backbone network at the same time.
Answer: FALSE
Diff: 3 Page Ref: 23

37) A MAN can be used to connect BNs and LANs.
Answer: TRUE
Diff: 3 Page Ref: 24

38) A cloud is a term used to logically represent connecting to a network infrastructure without being concerned as to how that infrastructure is configured, maintained, or controlled.
Answer: TRUE
Diff: 3 Page Ref: 24

39) A LAN is between a MAN and a WAN in terms of its geographic scope.
Answer: FALSE
Diff: 3 Page Ref: 25

40) A WAN will very commonly use circuits provided by common carriers.
Answer: TRUE
Diff: 3 Page Ref: 25

Essay Questions

1) Why is layered architecture so advantageous to OSI and TCP/IP models?
Answer: Each layer is assigned a specific set of functionalities and responsibilities. This means that one layer does not have to do the work of all the other layers or understand what the other layers are doing. Instead, each layer is responsible only for its assigned duties, no more, no less.
Diff: 2 Page Ref: 17

2) What are the three key services provided at the application layer of the OSI model?
Answer: (1) synchronizing the services between a user application and the protocol(s) it may use, (2) ensuring that necessary resources required by an application service are available, and (3) making sure that the correct communication protocol or service is available to the application.
Diff: 2 Page Ref: 18

3) Why do open models lend themselves to duplication?
Answer: The designers of technologies that use these models do not have to take on the cost and labor of creating new ones. Models, because they are conceptual, can be modified to fit varying conditions. Technologies based on established models provide known advantages and disadvantages. Software and hardware vendors who create products based on accepted models can produce products that have a wider consumer appeal.
Diff: 3 Page Ref: 18

4) What do the Open Systems Interconnection (OSI) and the Transmission Control Protocol/Internet Protocol (TCP/IP) models have in common?
Answer: First, they are both open architecture models. This means that anyone, anywhere, at any time, can freely design or create technologies based on these models, which is a real advantage. Second, both models are based on a layered architecture. This means that each model can be broken into several distinct components, called layers. Each layer within the model has its own particular and specific responsibilities and functionalities. A major topic discussed throughout this text is what these layers do, how they do it, and why. And finally, each model is well established and accepted by the data and telecommunications industries as models that provide clear guidelines as to how to build a data communications network that works. But remember, models are conceptual guidelines; how they are physically implemented can vary.
Diff: 2 Page Ref: 17

5) What are the responsibilities of the data link layer in the OSI model?
Answer: This layer takes unpackaged bit stream data arriving from the physical layer and packages the bits into units called frames. The data link layer attaches a physical address to each frame. This layer is responsible for getting each frame from one node to another on its way from sender to receiver. This layer also provides for flow control, error control, and access control. So, whereas the network layer provides for logical addressing, the data link layer provides for physical addressing.
Diff: 1 Page Ref: 19

6) What are some questions a networking technologist might ask before implementing a physical data communications network?
Answer: What is the purpose of the network? What services will this network be expected to provide? What types of connectivity, 10 people or 100,000, are required? What are the physical dimensions the network? Is the network limited to the size of a room or the expanse of a country? What type of business and user applications will this network have to support? Are the applications online real-time, 24/7 as they say, or are they batched? Based on business requirements, what bandwidth and transmission issues need to be addressed? Will there be a need for remote accessibility? What size budget is available? Will there be a qualified staff to support the network? Does management understand the types of resources the network might require, and is management willing to support those needs? Do any regulatory issues–city, state, county, national, and/or international–need to be addressed?
Diff: 3 Page Ref: 22

7) What is a MAN, a LAN, and a WAN? For what purpose is each used?
Answer: A metropolitan area network (MAN) is a network that generally spans a city or a county. An organization can use a MAN to cover greater distances at higher data rates than those offered by a LAN (local area network). A MAN can be used to connect BNs and LANs. An organization may find, if justified by transmission-volume needs, that having a private MAN may be less expensive than leasing these services from a local telecommunications company. A MAN is between a LAN and a WAN (wide area network) in terms of its geographic scope. However, MANs, unlike LANs, are usually subject to federal and state regulations.
Diff: 1 Page Ref: 23

8) Explain the two categories ("end-to-end layers" and "chained layers") of the OSI model's seven layers.
Answer: With the OSI model, the seven layers can be divided into two categories: end-to-end layers and chained layers. The top four layers are the end-to-end layers: application, presentation, session, and transport. These four layers are "end-to-end" because the layers on the sender's "end" and receiver's "end" directly communicate with each other. The four top layers on each "end" establish a communication. This communication provides an "end-to-end" connectivity. The remaining three lower layers–network, data link, and physical–are the chained layers. These three layers are "chained" in that they are used to link, or chain, one physical device to another in a communication path. The number of devices that need to be linked, or chained, depends on the number of intermediary devices or networks between the sender and receiver of a communication. In a network or enterprise, there may be many intermediary devices or networks between a sender and receiver. The lower three layers provide the chain of links that permits the sender and receiver to have a communication.
Diff: 2 Page Ref: 23

9) Describe a backbone network.
Answer: An organization's enterprise network may consist of dozens, hundreds, or thousands of individual networks. The networks of the enterprise are typically connected through a backbone network (BN). A BN is usually a high-speed circuit that connects all of the networks within the enterprise, allowing them to communicate with each other.
Diff: 3 Page Ref: 23

10) What is the role of common carriers in a WAN?
Answer: Business data communication needs may require that data be transported over great geographic distances, such as across a state, several states, a country, or even around the world. A network on this scale is called a wide area network (WAN). A WAN will very commonly use circuits provided by common carriers. In our discussion, a common carrier is a business or company that provides communication services of varying types to the general public. Common carriers include such organizations as Sprint, MCI, and AT&T, among others. A WAN can connect BNs and MANs. The infrastructures that create and support a WAN are heavily regulated. Figure 2.6 illustrates a WAN that spans a continent.
Diff: 2 Page Ref: 25