Chapter 1

Introduction to Data Communications

# True/False Questions

The following are possible True/False questions for tests. The statement is given and the answer is provided. The level of difficulty (easy, medium, hard), the reference section relevant to the topic, and learning objective are also furnished.

1. Due to advances in high speed communication networks, the information lag, or the time it takes for information to be disseminated around the world, has been significantly shortened.

Answer: True

Difficulty: Easy

Reference: Introduction

L.O.: Be aware of the applications of data communications networks

1. It is not uncommon for companies to end up spending more money on network management and security tasks than they do on the actual computer equipment itself.

Answer: True

Difficulty: Medium

Reference: Introduction

L.O.: Be aware of the three fundamental questions this book answers

1. The most frequently used database in organizations is Microsoft Access.

Answer: False

Difficulty: Medium

Reference: Introduction

L.O.: Be aware of the three fundamental questions this book answers

1. Telecommunications is the transmission of voice and video as well as data and usually implies transmitting a longer distance than in a data communication network.

Answer: True

Difficulty: Medium

Reference: Data Communications Networks

L.O.: Be familiar with the major components of and types of networks

1. A local area network (LAN) connects other LANs and backbone networks (BNs) located in different areas to each other and to wide area networks in a span from 3 to 30 miles.

Answer: False

Difficulty: Medium

Reference: Data Communications Networks

L.O.: Be familiar with the major components of and types of networks

1. An intranet is a LAN that uses Internet technologies and is publicly available to people outside of the organization.

Answer: False

Difficulty: Medium

Reference: Data Communications Networks

L.O.: Be familiar with the major components of and types of networks

1. A car manufacturer may give access to certain portions of its network to some of its suppliers via the Internet. This is an example of an extranet.

Answer: True

Difficulty: Medium

Reference: Data Communications Networks

L.O.: Be familiar with the major components of and types of networks

1. There are four computers that make networks what they are.

Answer: False

Difficulty: Easy

Reference: Data Communications Networks

L.O.: Be familiar with the major components of and types of networks

1. About half of all routers run Cisco IOS (Inter-operating system) that was specifically created for routers.

Answer: False

Difficulty: Easy

Reference: Data Communications Networks

L.O.: Be familiar with the major components of and types of networks

1. The OSI model is currently the most widely implemented network model used to develop and build networks of any size, including the Internet itself.

Answer: False

Difficulty: Medium

Reference: Network Models

L.O.: Understand the role of network layers

1. The data link layer has a global responsibility.

Answer: False

Difficulty: Medium

Reference: Network Models

L.O.: Understand the role of network layers

1. The transport layer has a local responsibility.

Answer: False

Difficulty: Medium

Reference: Network Models

L.O.: Understand the role of network layers

1. The network layer performs the same functions in both the OSI and Internet models and is responsible for routing messages from the source computer to the destination computer.

Answer: True

Difficulty: Easy

Reference: Network Models

L.O.: Understand the role of network layers

1. In the OSI model, the application layer provides a set of utilities for applications and is the end user’s access to the network.

Answer: True

Difficulty: Medium

Reference: Network Models

L.O.: Understand the role of network layers

1. The application layer is the seventh layer of the Internet model and specifies the type of connection and the electrical signals that pass through it.

Answer: False

Difficulty: Easy

Reference: Network Models

L.O.: Understand the role of network layers

1. At the transport layer in the Internet model, TCP is responsible for breaking large files received from the application layer into smaller messages and opening a connection to a server for transferring them.

Answer: True

Difficulty: Hard

Reference: Network Models

L.O.: Understand the role of network layers

1. Ethernet is an example of a network layer protocol.

Answer: False

Difficulty: Easy

Reference: Network Standards

L.O.: Be familiar with the role of network standards

1. Data communication standards enable each layer in the sending computer to communicate with its corresponding layer in the receiving computer.

Answer: True

Difficulty: Easy

Reference: Network Standards

L.O.: Be familiar with the role of network standards

1. The specification stage of the de jure standardization process consists of developing nomenclature and identifying the problems to be addressed.

Answer: True

Difficulty: Medium

Reference: Network Standards

L.O.: Be familiar with the role of network standards

1. ANSI is a voting participant in the ISO.

Answer: True

Difficulty: Easy

Reference: Network Standards

L.O.: Be familiar with the role of network standards

1. IoT technologies are restricted to consumer use.

Answer: False

Difficulty: Easy

Reference: Future Trends

L.O.: Be aware of three key trends in communications and networking.

1. All IoT technologies are connected to the Internet by WIFI.

Answer: False

Difficulty: Easy

Reference: Future Trends

L.O.: Be aware of three key trends in communications and networking.

## Multiple Choice

The following are possible multiple-choice questions for tests. The question is posed and the answer is provided under the choices. The level of difficulty (easy, medium, hard), the reference section relevant to the topic, and learning objective are also furnished.

1. Data communications and networking can be considered as a global area of study because:

a. new technologies and applications emerge from a variety of countries and spread around the world

b. the technologies enable global communication

c. the political and regulatory issues are exactly the same in every country

d. a and b

e. none of the above

Answer: d

Difficulty: Easy

Reference: Introduction

L.O.: Be familiar with the major components of and types of networks

1. The \_\_\_\_\_ Industrial Revolution is currently underway.

a. first

b. second

c. third

d. fourth

e. fifth

Answer: d

Difficulty: Easy

Reference: Introduction

L.O.: Be familiar with the major components of and types of networks

1. IT has four core capabilities within organizational settings. Which of the following is not one of these?

a. Verifying data

b. Storing and retrieving data

c. Protecting data

d. Automating data operations

e. Analyzing and visualizing data

Answer: a

Difficulty: Easy

Reference: Introduction

L.O.: Be familiar with the major components of and types of networks

1. Which of the following is **not** true about a server?

a. stores data and software that can be accessed by the client.

b. may be a personal computer or a mainframe on the network.

c. in client/server computing they work together over the network with client computers to support the business application.

d. can only perform one function on a network.

e. stores documents and graphics that can be accessed from any Web browser.

Answer: d

Difficulty: Hard

Reference: Data Communications Networks

L.O.: Be familiar with the major components of and types of networks

1. Networks that are designed to connect similar computers that share data and software with each other are called:

a. client/server networks

b. peer-to-peer networks

c. host networks

d. client networks

e. local area networks

Answer: b

Difficulty: Easy

Reference: Data Communications Networks

L.O.: Be familiar with the major components of and types of networks

1. The function of the file server is to :

a. store data and software programs that can be used by client computers on the network.

b. manage all printing requests from clients on the network.

c. transfer e-mail messages to other servers on the network.

d. store HTML documents for an Internet or intranet web site.

e. coordinate the communication of client and servers on the network.

Answer: a

Difficulty: Medium

Reference: Data Communications Networks

L.O.: Be familiar with the major components of and types of networks

1. A local area network is:

a. a large central network that connects other networks in a distance spanning exactly 5 miles.

b. a group of personal computers or terminals located in the same general area and connected by a common cable (communication circuit) so they can exchange information such as a set of rooms, a single building, or a set of well-connected buildings.

c. a network spanning a geographical area that usually encompasses a city or county area (3 to 30 miles).

d. a network spanning a large geographical area (up to 1000s of miles).

e. a network spanning exactly 10 miles with common carrier circuits.

Answer: b

Difficulty: Easy

Reference: Data Communications Networks

L.O.: Be familiar with the major components of and types of networks

1. A backbone network is:

a. a high speed central network that connects other networks in a distance spanning up to several miles.

b. a group of personal computers or terminals located in the same general area and connected by a common cable (communication circuit) so they can exchange information.

c. a network spanning a geographical area that usually encompasses a city or county area (3 to 30 miles).

d. a network spanning a large geographical area (up to 1000s of miles).

e. a network spanning exactly 200 miles with common carrier circuits.

Answer: a

Difficulty: Medium

Reference: Data Communications Networks

L.O.: Be familiar with the major components of and types of networks

1. Which of the following is *not* a property of a WAN:

a. connects backbone networks and MANS.

b. spans hundreds or thousands of miles

c. provides data transmission speeds from 56Kbps to 10Gbps.

d. connects a group of computers in a small geographic area such as room, floor, building or campus.

e. uses leased lines from IXCs like ATT, MCI, and Sprint.

Answer: d

Difficulty: Medium

Reference: Data Communications Networks

L.O.: Be familiar with the major components of and types of networks

1. A(n) \_\_\_\_\_\_\_\_\_ is a LAN that uses the same technologies as the Internet but is open to only those inside the organization.

a. WAN

b. BN

c. extranet

d. intranet

e. MAN

Answer: d

Difficulty: Easy

Reference: Data Communications Networks

L.O.: Be familiar with the major components of and types of networks

1. A(n) \_\_\_\_\_\_\_\_\_ is a LAN that uses the same technologies as the Internet but is provided to invited users outside the organization who access it over the Internet.

a. WAN

b. BN

c. extranet

d. intranet

e. MAN

Answer: c

Difficulty: Easy

Reference: Data Communications Networks

L.O.: Be familiar with the major components of and types of networks

1. A/n \_\_\_\_\_ is a group of computers located in the same general area.

a. local area network

b. backbone network

c. wide area network

d. intranet

e. extranet

Answer: a

Difficulty: Easy

Reference: Data Communications Networks

L.O.: Be familiar with the major components of and types of networks

1. A/n \_\_\_\_\_ is a large, central network connecting several LANs, BNs, MANs, and WANs.

a. local area network

b. backbone network

c. wide area network

d. intranet

e. extranet

Answer: b

Difficulty: Easy

Reference: Data Communications Networks

L.O.: Be familiar with the major components of and types of networks

1. A/n \_\_\_\_\_ connect BNs and MANs.

a. local area network

b. backbone network

c. wide area network

d. intranet

e. extranet

Answer: c

Difficulty: Easy

Reference: Data Communications Networks

L.O.: Be familiar with the major components of and types of networks

1. A/n \_\_\_\_\_ is a LAN that uses the same technologies as the Internet but is open to only those inside the organization.

a. local area network

b. backbone network

c. wide area network

d. intranet

e. extranet

Answer: d

Difficulty: Easy

Reference: Data Communications Networks

L.O.: Be familiar with the major components of and types of networks

1. A/n \_\_\_\_\_ uses the same technologies as the Internet but is provided to invited users outside the organization who access it over the Internet.

a. local area network

b. backbone network

c. wide area network

d. intranet

e. extranet

Answer: e

Difficulty: Easy

Reference: Data Communications Networks

L.O.: Be familiar with the major components of and types of networks

1. Your college provides a special high-speed network for students that can only be accessed on campus. This is a \_\_\_\_\_.

a. local area network

b. backbone network

c. wide area network

d. intranet

e. extranet

Answer: d

Difficulty: Easy

Reference: Data Communications Networks

L.O.: Be familiar with the major components of and types of networks

1. Which layer of the OSI model is responsible for ensuring that all packets sent are received by the destination station by dealing with end-to-end issues?

a. presentation

b. transport

c. physical

d. session

e. application

Answer: b

Difficulty: Easy

Reference: Networking Models

L.O.: Understand the role of network layers

1. Which layer of the OSI model is responsible for ensuring flow control so that the destination station does not receive more packets that it can process at any given time?

a. presentation

b. transport

c. physical

d. session

e. application

Answer: b

Difficulty: Easy

Reference: Networking Models

L.O.: Understand the role of network layers

1. The \_\_\_\_\_\_\_\_\_\_\_\_ layer of the OSI model is responsible for data format translation.

a. session

b. presentation

c. physical

d. application

e. transport

Answer: b

Difficulty: Easy

Reference: Networking Models

L.O.: Understand the role of network layers

1. In the Internet model, the application layer corresponds to the \_\_\_\_\_\_\_\_ layer(s) of the OSI model.

a. data link and network

b. session, presentation and application

c. application layer

d. application and presentation

e. network, transport and presentation

Answer: b

Difficulty: Hard

Reference: Networking Models

L.O.: Understand the role of network layers

1. The fourth layer of the OSI model is called the \_\_\_\_\_\_\_\_\_\_ layer.

a. network

b. transport

c. session

d. data link

e. presentation

Answer: b

Difficulty: Easy

Reference: Networking Models

L.O.: Understand the role of network layers

1. \_\_\_\_\_\_\_\_\_\_\_ is an orderly close to a dialogue between end users.

a. Session termination

b. Physical bits

c. Frame overhead

d. Packet encapsulation

e. Message encryption

Answer: a

Difficulty: Hard

Reference: Networking Models

L.O.: Understand the role of network layers

1. The \_\_\_\_\_\_\_\_\_ layer performs error checking which is redundant to some extent with the function of the \_\_\_\_\_\_\_\_\_ layer.

a. application, presentation

b. physical, data link

c. transport, data link

d. presentation, transport

e. network, physical

Answer: c

Difficulty: Medium

Reference: Networking Models

L.O.: Understand the role of network layers

1. Which is **not** a function of the physical layer:

a. transmission of bits.

b. defining the rules by which one and zeroes are transmitted.

c. providing error-free transmission of data.

d. providing the physical connection between sender and receiver.

e. specifying the type of connection and type of signals, waves or pulses that pass through it.

Answer: c

Difficulty: Hard

Reference: Networking Models

L.O.: Understand the role of network layers

1. The \_\_\_\_\_\_\_\_\_ layer is responsible for routing of messages from the sender to the final destination.

a. data communication layer

b. resident layer

c. application layer

d. network layer

e. physical layer

Answer: d

Difficulty: Easy

Reference: Networking Models

L.O.: Understand the role of network layers

1. Which of the following is **not** a function of the data link layer?

a. deciding when to transmit messages over the media

b. formatting the message by indicating where messages start and end, and which part is the address

c. detecting and correcting any errors that have occurred in the transmission of the message

d. specifying the type of connection, and the electrical signals, radio waves, or light pulses that pass through it

e. controlling the physical layer by determining when to transmit

Answer: d

Difficulty: Easy

Reference: Networking Models

L.O.: Understand the role of network layers

1. Which of the following is a function of the transport layer?

a. linking the physical layer to the network layer

b. formatting messages by indicating where they start and end

c. deciding which route the message should take

d. breaking long messages into several smaller messages

e. specifying the type of connection and the electrical signals, radio waves, or light pulses that pass through it

Answer: d

Difficulty: Easy

Reference: Networking Models

L.O.: Understand the role of network layers

1. Which of the following is a term used to group together the physical and data link layers?

a. Internetwork layers

b. Hardware layers

c. Software layers

d. Middleware layers

e. Application layers

Answer: b

Difficulty: Medium

Reference: Networking Models

L.O.: Understand the role of network layers

1. Which of the following would be a standard or protocol used at the Data Link layer of the Internet or OSI model?

a. IP

b. TCP

c. Ethernet

d. HTTP

e. FTP

Answer: c

Difficulty: Medium

Reference: Networking Models

L.O.: Understand the role of network layers

1. In which layer of the Internet model would the HTTP protocol be used?

a. physical

b. application

c. transport

d. network

e. data link

Answer: b

Difficulty: Medium

Reference: Networking Models

L.O.: Understand the role of network layers

1. A(n) \_\_\_\_\_\_\_\_\_\_\_\_\_ is a set of rules that determine what a layer would do and provides a clearly defined set of messages that software at the layer needs to understand.

a. agreement

b. specification

c. protocol

d. regulation

e. policy

Answer: c

Difficulty: Medium

Reference: Networking Models

L.O.: Understand the role of network layers

1. The network layer of the Internet model uses the \_\_\_\_\_\_\_\_\_\_\_\_\_ protocol to route messages though the network.

a. TCP

b. HTTP

c. FTP

d. SMTP

e. IP

Answer: e

Difficulty: Medium

Reference: Networking Models

L.O.: Understand the role of network layers

1. The primary reason for networking standards is to:

a. simplify cost accounting for networks

b. ensure that hardware and software produced by different vendors can work together

c. make it more difficult to develop hardware and software that link different networks

d. ensure that all network components of a particular network can be provided by only one vendor

e. lock customers into buying network components from one vendor

Answer: b

Difficulty: Medium

Reference: Network Standards

L.O.: Be familiar with the role of network standards

1. Which of the following is **not** true about de jure standards?

a. They are always developed before de facto standards.

b. One example exists for network layer software (IP).

c. They can be developed by an official industry body.

d. They can take several years to develop.

e. They can be developed by a government body.

Answer: a

Difficulty: Medium

Reference: Network Standards

L.O.: Be familiar with the role of network standards

1. Which of the following is **not** true about de facto standards?

a. They never evolve into de jure standards.

b. They are those standards that emerge in the marketplace.

c. They tend not to be developed by an official industry or government body.

d. They are generally supported by more than one vendor but de facto standards have no official standing.

e. They tend to emerge based upon the needs/response of the marketplace.

Answer: a

Difficulty: Medium

Reference: Network Standards

L.O.: Be familiar with the role of network standards

1. The three stages of the de jure standardization process are \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_.

a. specification, identification of choices and acceptance.

b. planning, implementing and acceptance.

c. brainstorming, identification and implementing.

d. specification, formalization, and acceptance.

e. none of the above.

Answer: a

Difficulty: Easy

Reference: Network Standards

L.O.: Be familiar with the role of network standards

1. Which of the following is true about ISO:

a. It makes technical recommendations about data communications interfaces

b. Its name stands for International Organization for Standardization

c. It is based in Geneva, Switzerland

d. It is one of the most important standards-making bodies

e. All of the above

Answer: e

Difficulty: Medium

Reference: Network Standards

L.O.: Be familiar with the role of network standards

1. Which of the following is **not** true about ITU-T:

a. It is the technical standards-setting organization of the United Nations International Telecommunications Union

b. It is the International Telecommunications Union – Telecommunications Group

c. Its membership is limited to U.S. telephone companies

d. It is based in Geneva, Switzerland

e. Its membership is comprised of representatives from over 200 member countries

Answer: c

Difficulty: Medium

Reference: Network Standards

L.O.: Be familiar with the role of network standards

1. The American National Standards Institute:

a. is the coordinating organization for the United States’ national system of standards

b. is a professional society in the U.S. whose standards committees focus on local area network standards

c. sets the standards that govern how much of the Internet will operate

d. is an agency that develops federal information processing standards for the federal government

e. makes technical recommendations about global telephone rates

Answer: a

Difficulty: Medium

Reference: Network Standards

L.O.: Be familiar with the role of network standards

1. The Internet standards organization that will allow anyone to join is \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_.

a. ANSI

b. ISO

c. IETF

d. IEEE

e. ITU-T

Answer: c

Difficulty: Medium

Reference: Network Standards

L.O.: Be familiar with the role of network standards

1. Which standards body is responsible for the development of local area network (LAN) standards?

a. ANSI

b. ISO

c. IETF

d. IEEE

e. ITU-T

Answer: d

Difficulty: Medium

Reference: Network Standards

L.O.: Be familiar with the role of network standards

1. Which of the following is **not** an application layer standard?

a. HTTP

b. POP

c. T1

d. IMAP

e. HTML

Answer: c

Difficulty: Easy

Reference: Network Standards

L.O.: Be familiar with the role of network standards

1. Which of the following is not a data link layer standard?

a. HTTP

b. Ethernet

c. T1

d. PPP

e. Frame Relay

Answer: a

Difficulty: Easy

Reference: Network Standards

L.O.: Be familiar with the role of network standards

1. Which of the following is **not** an important future trend in communication and networking?

a. development of online batch systems

b. massively online systems

c. the Internet of Things

d. Wireless LAN

e. BYOD

Answer: a

Difficulty: Medium

Reference: Future Trends

L.O.: Be aware of three key trends in communications and networking

1. \_\_\_\_\_\_\_\_\_\_ ensure that hardware and software produced by different vendors work together.

a. Delimiters

b. Standards

c. ASPs

d. RBOCs

e. Intranets

Answer: b

Difficulty: Easy

Reference: Network Standards

L.O.: Be familiar with the role of network standards

1. A \_\_\_\_\_\_\_\_\_\_\_\_\_ is the input-output hardware device at the end user’s end of a communication circuit in a client-server network.

a. server

b. circuit

c. client

d. host

e. mouse

Answer: c

Difficulty: Easy

Reference: Data Communications Networks

L.O.: Be familiar with the major components of and types of networks

1. A(n) \_\_\_\_\_\_\_\_\_\_\_ is similar to an intranet in that it uses Internet technologies, but is developed for users outside the organization.

a. intranet

b. Usenet

c. Wide Area Network

d. extranet

e. sneaker net

Answer: d

Difficulty: Easy

Reference: Network Models

L.O.: Be familiar with the major components of and types of networks

1. Taken together, the physical and data link layers are called the \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_.

a. Internet layer

b. Hardware layer

c. Internetwork layer

d. Application layer

Answer: b

Difficulty: Easy

Reference: Network Models

L.O.: Be familiar with the major components of and types of networks

1. BYOD stands for

a. Bring Your Own Device

b. Bring Your Own Database

c. Build Your Own Device

d. Build Your Own Database

Answer: a

Difficulty: Easy

Reference: Future Trends

L.O.: Be aware of three key trends in communications and networking

1. When a user accesses an application via a web browser on their mobile device, this is referred to as

a. a browser-based approach

b. a native app

c. Internet Explorer

d. BYOD

Answer: a

Difficulty: Easy

Reference: Future Trends

L.O.: Be aware of three key trends in communications and networking

1. A MOOC is an example of a(n)

a. BYOD

b. massively online technology

c. native app

d. browser-based technology

Answer: b

Difficulty: Easy

Reference: Future Trends

L.O.: Be aware of three key trends in communications and networking

1. A network administrator has received several reports from users of the network that the intranet website on one of company servers is not accessible, but the same users are still able to retrieve their email being stored on the same server. What layer of the Internet model does this problem appear to reside at?

a. physical

b. transport

c. network

d. application

e. data link

Answer: d

Difficulty: Medium

Reference: Network Models

L.O.: Understand the role of network layers

1. A junior network administrator has used the wrong cable type to connect his/her computer to the administrative port on a router and cannot establish a terminal session with the device. What layer of the Internet model does this problem appear to reside at?

a. physical

b. transport

c. network

d. application

e. data link

Answer: a

Difficulty: Medium

Reference: Network Models

L.O.: Understand the role of network layers

1. Which of the following correctly represents order of the seven layers of the OSI model from layer 1 to layer 7?

a. physical, network, data link, session, transport, application, presentation

b. physical, data link, network, transport, session, application, presentation

c. physical, data link, network, transport, session, presentation, application

d. data link, physical, network, session, transport, application, presentation

e. data link, physical, network, transport, session, presentation, application

Answer: c

Difficulty: Medium

Reference: Network Models

L.O.: Understand the role of network layers

1. When a developer creates an application for each type of device that might be used, this is referred to as

a. a browser-based approach

b. a native app

c. Internet Explorer

d. BYOD

Answer: b

Difficulty: Easy

Reference: Future Trends

L.O.: Be aware of three key trends in communications and networking

1. The \_\_\_\_\_\_\_ is a connection of computers and networks built into common, everyday devices.

a. BYOD

b. Internet of Things

c. Web of lies

d. Wide Area Network

Answer: b

Difficulty: Easy

Reference: Future Trends

L.O.: Be aware of three key trends in communications and networking