2.2.7 Practice Questions

Candidate: Keith Hibbard (hibbarkm@miamioh.edu)
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Score: 100%

Passing Score: 80%

Question 1. ✓ Correct

Put the OSI model layers in order.

Layer 7

✓ Application

Layer 6

✓ Presentation

Layer 5

✓ Session

Layer 4

✓ Transport

Layer 3

✓ Network

Layer 2

✓ Data Link

Layer 1

✓ Physical

Explanation

Layer	Name	Mnemonic (Top-down)	Mnemonic (Bottom-up)
Layer 7	Application	All	Away
Layer 6	Presentation	People	Pizza
Layer 5	Session	Seem	Sausage
Layer 4	Transport	To	Throw
Layer 3	Network	Need	Not
Layer 2	Data Link	Data	Do
Layer 1	Physical	Processing	Please

References

2.2.3 OSI Model Facts

resources\text\t_osimod_ccna7\q_osimod_01_ccna7.question.xml

Question 2. ✓ Correct

Which of the following are limitations of the OSI model? (Select two.)

→ ☑ A particular protocol implementation may not represent every OSI layer.

☐ A particular protocol implementation must represent every OSI layer

☐ Requires specialization of features at different levels.

→ ☑ OSI layers are theoretical and do not actually perform real functions.

☐ OSI layers are not theoretical and actually perform real functions.

Explanation

The following are limitations of the OSI model:

- OSI layers are theoretical and do not actually perform real functions.
- Industry implementations rarely have a layer-to-layer correspondence with the OSI layers.
- Different protocols within the stack perform different functions that help send or receive the overall message.
- A particular protocol implementation may not represent every OSI layer (or may spread across multiple layers).

References

2.2.3 OSI Model Facts

resources\text\t_osimod_ccna7\q_osimod_02_ccna7.question.xml

Question 3. ✓ Correct

Which of the following are functions of the MAC sublayer in the OSI model? (Select two.)

- → ☑ Letting devices on the network have access to the LAN.
- ☐ Mapping hardware addresses to link-layer addresses.
- → ☑ Defining a unique hardware address for each device on the network.
- ☐ Maintaining orderly delivery of frames through sequencing.
- ☐ Creating routing tables based on MAC addresses.

Explanation

The MAC sublayer in the OSI model defines a unique MAC or data-link address for each device on the network. This address is usually assigned by the manufacturer. The MAC sublayer also provides devices with access to the network media.

Mapping hardware addresses to link-layer addresses and creating routing tables based on MAC addresses are not functions of the MAC sublayer.

Maintaining orderly delivery of frames through sequencing occurs at the Logical Link Control layer.

References

2.2.4 OSI Layer Summary

resources\text\t_ositable_ccna7\q_ositable_01_ccna7.question.xml

Question 4. ✓ Correct

Which two of the following functions are performed by IP? (Select two.)

- [ ] Creating multicast groups.
- [ ] Delivering IP addresses to hosts.
- [ ] Discovering the MAC address of a host.
- [x] → Routing datagrams to their destination.
- [x] → Identifying hosts with the IP address.

Explanation

IP is responsible for moving data through the network. It identifies devices by their IP addresses and routes datagrams based on this address. The other functions listed here are performed by other protocols in the TCP/IP suite.

References

2.2.4 OSI Layer Summary

resources\text\t_ositable_ccna7\q_ositable_02_ccna7.question.xml

Question 5. ✓ Correct

A client computer starts to download some files from an FTP server named FTPsvr1. While the first download is in progress, the user opens a second instance of the FTP program and initiates a second download.

What do the server and the client use to keep each download separate?

- Sequence numbers
- CRC
- IP Address
- Port or socket numbers
- → Session ID

Explanation

Communication instances are kept separate by session IDs. Each communication instance is identified with a session ID.

Port or socket numbers are used to identify a service running on the server. For example, FTP uses ports 20 and 21 to send communications to the FTP service running on the server. Both sessions would use the same port number(s) to communicate.

Sequence numbers are used in packets to make sure that packets can be reassembled in the proper order and to identify lost packets.

The Cyclical Redundancy Check (CRC) is used in a packet or a frame to identify errors within the packet or the frame.

The IP address identifies a network interface.

References

2.2.4 OSI Layer Summary

resources\text\t_ositable_ccna7\q_ositable_03_ccna7.question.xml

Question 6. ✓ Correct

What is the purpose of the CRC in network communications?

→ ◉ Detect data errors

○ Detect lost packets

○ Request retransmission

○ Correct data errors

Explanation

The Cyclical Redundancy Check (CRC) is a mathematical calculation added to each frame. Its purpose is to detect when a frame arrives that has been corrupted. The sending device calculates the CRC and adds it to the frame. The receiving device calculates the CRC when the frame is received. If the CRCs do not match, the frame has been corrupted or altered. The most common method for correcting errors is to request retransmission of the original frame.

Lost packets are detected by missing sequence numbers or missing acknowledgements. Packet sequence numbers are also used to re-assemble packets into their original order.

References

2.2.4 OSI Layer Summary

resources\text\t_ositable_ccna7\q_ositable_04_ccna7.question.xml

Question 7. ✓ Correct

The following items describe the functions performed at various OSI model layers:

1. Logical topology, hardware addresses, media access, framing
2. Logical device identification, path identification, and selection
3. Flow control, reliable data transfer, windowing, segmentation, and sequencing
4. Converting data to 0s and 1s, bit signaling, and synchronization

Which of the following correctly identifies, in order, the layers that perform each of the functions listed here?

- ○ Network, Transport, Physical, Data Link
- ○ Network, Data Link, Transport, Physical
- ○ Transport, Network, Physical, Data Link
- → ◉ Data Link, Network, Transport, Physical
- ○ Physical, Transport, Network, Data Link

Explanation

The following OSI model layers correspond to the following functions:

- Data Link: Logical topology, hardware addresses, media access, framing
- Network: Logical device identification, path identification, and selection
- Transport: Flow control, reliable data transfer, windowing, segmentation, and sequencing
- Physical: Converting data to 0s and 1s, bit signaling, and synchronization

References

2.2.4 OSI Layer Summary

resources\text\t_ositable_ccna7\q_ositable_05_ccna7.question.xml

Question 8. ✓ Correct

Drag the information type on the left to the appropriate layer of the OSI model that it is associated with on the right.

Network Layer

✓ Packets

Data Link Layer

✓ Frames

Physical Layer

✓ Bits

Transport Layer

✓ Segments

Application Layer

✓ Data

Explanation

Encapsulation is the process of breaking a message into packets, adding control and other information, and transmitting the message through the transmission media. You need to know the following four-step data encapsulation process on the sending system using the OSI model:

- The Application layer prepares the data to be sent through the network.
- The Transport layer breaks the data into pieces called segments adding sequencing and control information.
- The Network layer converts the segments into packets, adding logical network and device addresses.
- The Data Link layer converts the packets into frames, adding physical device addressing information.
- The Physical layer converts the frames into bits for transmission across the transmission media.

References

2.2.4 OSI Layer Summary

resources\text\t_ositable_ccna7\q_ositable_06_ccna7.question.xml

Question 9.

✓ Correct

Match the TCP/IP protocols with their functions.

Used to send email messages between mail servers.

✓ SMTP

Used to send messages to groups of users.

✓ IGMP

Used to assign IP addresses to hosts.

✓ DHCP

Used to get the MAC address of a host from its IP address.

✓ ARP

Explanation

The Simple Mail Transfer Protocol (SMTP) is used to route electronic mail between mail servers.

Internet Group Membership Protocol (IGMP) is a protocol for defining host groups. All group members can receive broadcast messages intended for the group (called multicasts).

The Dynamic Host Configuration Protocol (DHCP) is used for delivering IP information to connected devices configured to use DHCP or automatic addressing.

The Address Resolution Protocol (ARP) is used to get the MAC address of a host from a known IP address. ARP is used within a subnet to get the MAC address of a device on the same subnet as the requesting device.

The Internet Control Message Protocol (ICMP) works closely with IP to provide error and control information that helps move data packets through the internetwork.

The Simple Network Management Protocol (SNMP) is used to manage networks. SNMP lets network devices exchange configuration and status information. This information can be gathered by management software and used to monitor and manage the network.

References

2.2.6 TCP/IP Protocol Suite Facts

resources\text\t_ipprotocols_ccna7\q_ipprotocols_01_ccna7.question.xml

Question 10. ✓ Correct

Match the TCP/IP protocols with their functions.

Group 1

Used to get the IP address of a host from a known MAC address.

✓ RARP

✓ BOOTP

Group 2

Used to transfer files.

✓ FTP

✓ TFTP

Group 3

Used to identify routes through an internetwork.

✓ RIP

✓ OSPF

Explanation

Both BOOTP (Bootstrap Protocol) and RARP (Reverse Address Resolution Protocol) are used to discover the IP address of a device with a known MAC address. BOOTP is an enhancement to RARP, and it is more commonly implemented than RARP. As its name implies, BOOTP is used by computers as they boot to receive an IP address from a BOOTP server. The Address Resolution Protocol (ARP) is used to get the MAC address of a host from a known IP address.

Both the File Transfer Protocol (FTP) and the Trivial File Transfer Protocol (TFTP) are used for transferring files. FTP uses TCP to guarantee delivery, while TFTP uses UDP for fast data transfer. The Hypertext Transfer Protocol (HTTP) is used by web browsers and web servers to exchange files (such as web pages) through the World Wide Web and intranets.

Open Shortest Path First (OSPF) and Routing Information Protocol (RIP) are routing protocols. Routing protocols discover the path through an internetwork and are used to select the best path through an internetwork.

Transmission Control Protocol (TCP) provides connection-oriented services and performs segment sequencing and service addressing. It also performs important error-checking functions and is considered a host-to-host protocol.

References

2.2.6 TCP/IP Protocol Suite Facts