参考：https://www.9tut.com/ccna-osi-model-questions/comment-page-8

Question 1

Which of the following correctly describe steps in the OSI data encapsulation process? (Choose two)

A. The transport layer divides a data stream into segments and may add reliability and flow control information.

B. The data link layer adds physical source and destination addresses and an FCS to the segment.

C. Packets are created when the network layer encapsulates a frame with source and destination host addresses and protocol-related control information.

D. Packets are created when the network layer adds Layer 3 addresses and control information to a segment.

E. The presentation layer translates bits into voltages for transmission across the physical link.

Answer: A D

Explanation

The transport layer segments data into smaller pieces for transport. Each segment is assigned a sequence number, so that the receiving device can reassemble the data on arrival.

The transport layer also use flow control to maximize the transfer rate while minimizing the requirements to retransmit. For example, in TCP, basic flow control is implemented by acknowledgment by the receiver of the receipt of data; the sender waits for this acknowledgment before sending the next part.

-> A is correct.

The data link layer adds physical source and destination addresses and an Frame Check Sequence (FCS) to the packet (on Layer 3), not segment (on Layer 4) -> B is not correct.

Packets are created when network layer encapsulates a segment (not frame) with source and destination host addresses and protocol-related control information. Notice that the network layer encapsulates messages received from higher layers by placing them into datagrams (also called packets) with a network layer header -> C is not correct.

The Network layer (Layer 3) has two key responsibilities. First, this layer controls the logical addressing of devices. Second, the network layer determines the best path to a particular destination network, and routes the data appropriately.

-> D is correct.

The Physical layer (not presentation layer) translates bits into voltages for transmission across the physical link -> E is not correct.

Question 2

Which layer of the OSI reference model uses the hardware address of a device to ensure message delivery to the proper host on a LAN?

A. physical

B. data link

C. network

D. transport

Answer: B

Explanation

The hardware address of a device or the Media Access Control (MAC) address is added in the Data Link layer. An Ethernet MAC address is a 48-bit binary value expressed as 12 hexadecimal digits (for example: 00:15:A4:CB:03:CA).

Question 3

Which layer of the OSI reference model uses flow control, sequencing, and acknowledgments to ensure that reliable networking occurs?

A. data link

B. network

C. transport

D. presentation

E. physical

Answer: C

Question 4

Which layer in the OSI reference model is responsible for determining the availability of the receiving program and checking to see if enough resources exist for that communication?

A. transport

B. network

C. presentation

D. session

E. application

Answer: E

Question 5

Data transfer is slow between the source and destination. The quality of service requested by the transport layer in the OSI reference model is not being maintained. To fix this issue, at which layer should the troubleshooting process begin?

A. presentation

B. session

C. transport
D. network
E. physical

Answer: D

Question 6

Which protocols are found in the network layer of the OSI reference model and are responsible for path determination and traffic switching?
A. LAN
B. routing
C. WAN
D. network

Answer: B

Question 7

Refer to the exhibit. An administrator pings the default gateway at 10.10.10.1 and sees the output as shown. At which OSI layer is the problem?

```
C:\> ping 10.10.10.1
Pinging 10.10.10.1 with 32 bytes of data:
Request timed out.
Request timed out.
Request timed out.
Request timed out.
Ping statistics for 10.10.10.1:
Packets: sent = 4, Received = 0, Lost = 4 (100% loss)
```

A. data link layer
B. application layer
C. access layer
D. session layer
E. network layer

Answer: E

Explanation

The Network layer is responsible for network addressing and routing through the internetwork. So a ping fails, you may have an issue with the Network layer (although lower layers like Data Link & Physical may cause the problem).

Question 8

Which of the following are types of flow control? (Choose three)
A. buffering
B. cut-through
C. windowing
D. congestion avoidance
E. load balancing

Answer: A C D

Explanation

Three types of flow control are buffering, windowing & congestion avoidance:
+ **Buffering**: If a device receives packets too quickly for it to handle then it can store them in a memory section called a buffer and proceed them later.
+ **Windowing**: a window is the quantity of data segments that the transmitting device is allowed to send without receiving an acknowledgment for them. For example:
With the window size of 1, the sending device sends 1 segment and the receiving device must reply with 1 ACK before the sending device can send the next segment. This "waiting" takes some time.
By increasing the window size to 3, the sending device will send up to 3 segments before waiting an ACK -> helps reduce the waiting time.
+ **Congestion avoidance**: lower-priority traffic can be discarded when the network is overloaded -> minimize delays.

Question 9

A network administrator is verifying the configuration of a newly installed host by establishing an FTP connection to a remote server. What is the highest layer of the protocol stack that the network administrator is using for this operation?

A. application
B. presentation
C. session
D. transport
E. internet
F. data link

Answer: A

Explanation

FTP belongs to Application layer and it is also the highest layer of the OSI model.

Question 10

A receiving host computes the checksum on a frame and determines that the frame is damaged. The frame is then discarded. At which OSI layer did this happen?

A. session
B. network
C. physical
D. data link
E. transport

Answer: D

Explanation

When using the term "frame" we can easily recognize it belongs to the Data Link layer. In this layer, an Frame Check Sequence (FCS) field is added to the frame to verify that the frame data is received correctly.

Question 11

As a frame leaves a Layer 3 device, the Layer 2 encapsulation information is changed from what it was when it entered the device. For what two reasons can this happen? (Choose two)

A. The data is moving from 10BASE-TX to 100BASE-TX.
B. The WAN encapsulation type has changed.
C. The data format has changed from analog to digital.
D. The source and destination hosts are in the same subnet.
E. The source and destination MAC addresses have changed.

Answer: B E

Question 12

Acknowledgement, Sequencing, and Flow control are characteristics of which OSI layer?

A. Layer 2
B. Layer 3
C. Layer 4
D. Layer 5
E. Layer 6
F. Layer 7

Answer: C