# MC questions for Unit 2

Red color indicates the correct answer.

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## Question 1

Transmission media are usually categorized as _____.

- fixed or unfixed
- guided or unguided
- determinate or indeterminate
- metallic or nonmetallic

## Question 2

The radio communication spectrum is divided into bands based on _____.

- amplitude
- frequency
- cost and hardware
- transmission medium

## Question 3

What is the total delay to send a 500 byte message across a 4 Mbps link that has a propagation delay of 5 ms?

- 1 ms
- 5 ms
- 6 ms
- 9 ms

## Question 4

What is the maximum amount of data in flight for a 5 Mbps Internet access link with a propagation delay of 4ms? The amount of data in flight refers to the number of bits or bytes that have been transmitted from the source but not yet been received by the destination.

- (•) 2500 bytes
- ( ) 25 kB
- ( ) 200000 bits
- ( ) 20 bytes

## Question 5

Arrange the OSI layers from top to bottom.

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

## Question 6

Match the OSI layers to their functionalities.

| | |
|---|---|
| Application Layer | Defines rules to support email transfer |
| Presentation Layer | Encrypt the message for privacy |
| Session Layer | Ensure communication is done in a half-duplex manner |
| Transport Layer | Reassemble received packets in the correct order |
| Network Layer | Determine a path to transfer packets from source to destination |
| Data Link Layer | Detect whether bit errors have been occurred when packets are transmitted across a transmission link |
| Physical Layer | Map bits into signals for transmission |

# Question 7

Match each layer to the name of packets in that layer

| | |
|---|---|
| Application Layer | Message |
| Transport Layer | Segment |
| Network Layer | Datagram |
| Data Link Layer | Frame |

# Question 8

A 1500 byte user message is sent over a link using the IP and Ethernet protocols, each of which has a 20 byte header. *What percentage of the link bandwidth is used to carry the protocol headers?*

- 3.3%
- 2.7%
- 1.3%
- 2.6%

# Question 9

A message M is encapsulated by the UDP, IP and Ethernet protocols in that order as it travels down a protocol stack. *What does the message look like when observed "on the wire" of the Ethernet link?*

Use U, I, and E to represent the UDP header, IP header, and Ethernet header, respectively. Use M to represent the message. Write the parts in the order that they are transmitted "on the wire", i.e., the first part sent is leftmost.

- U I E M
- E I U M
- M U I E
- I U M

## Question 10

An incoming frame ABC "on the wire" (where A, B, and C stand for headers of their respective protocols and are given in the order that they are received) is demultiplexed and processed by the protocols. *What message is passed to protocol B, and what message does protocol B pass onwards?* We suggest you draw your own picture of processing at each protocol.

- Protocol B gets AB from protocol A, and passes BC to protocol C.
- Protocol B gets ABC from protocol C, and passes ABC to protocol A.
- Protocol B gets ABC from protocol A, and passes BC to protocol C.
- Protocol B gets BC from protocol A, and passes C to protocol C.