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**DUBAI INTERNATIONAL ACADEMIC CITY, DUBAI**

**FIRST SEMESTER 2023 – 2024**

**COURSE:** CSF303 (Computer Network)

**COMPONENT:** Tutorial Sheet 2 **DATE:** 15th February 2024

1. A system has an *n*-layer protocol hierarchy. Applications generate messages of length *M* bytes. At each of the layers, an *h*-byte header is added. What fraction of the network bandwidth is filled with headers?
2. When a file is transferred between two computers, two acknowledgement strategies are possible. In the first one, the file is chopped up into packets, which are individually acknowledged by the receiver, but the file transfer as a whole is not acknowledged. In the second one, the packets are not acknowledged individually, but the entire file is acknowledged when it arrives. Discuss these two approaches.
3. Which OSI layer header contains the address of a destination host that is on another network?
4. Which of the following correctly describe steps in the OSI data encapsulation process? (Choose two)
   1. The transport layer divides a data stream into segments and may add reliability and flow control information.
   2. The data link layer adds physical source and destination addresses and an FCS to the segment.
   3. Packets are created when the network layer encapsulates a frame with source and destination host addresses and protocol-related control information.
   4. Packets are created when the network layer adds Layer 3 addresses and control information to a segment.
   5. The presentation layer translates bits into voltages for transmission across the physical link.
5. 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?
6. Which of the following is an example of physical layer vulnerability?

a)MAC Address Spoofing  
b) Physical Theft of Data  
c) Route spoofing  
d) Weak or non-existent authentication

1. **How Data breaks down on each layer from top to bottom ?**
2. 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) |

1. How long does it take to send a file of 640,000 bits from host A to host B over a circuit-switched network?

All links are 1.536 Mb/s

Each link uses TDM with 24 slots/sec (TDM = Time Division Multiplexing)

500 msec to establish end-to-end circuit.

1. **Hosts A and B are each connected to a switch S via 100-Mbps links. The propagation delay on each link is 20 μs. S is a store-and-forward device; it begins retransmitting a received packet 35 μs after it has finished receiving it. Calculate the total time required to transmit 10,000 bits from A to B**
   1. **As a single packet.**
   2. **As two 5000-bit packets sent one right after the other.**