Subject :	SEHH2238 : Computer Networking
Lab/Tutorial :	**Session 6 : LAN & Internetworking**

Ethernet & Wireless LAN

1. An Ethernet MAC sublayer receives 42 bytes of data from the upper layer. How many bytes of padding must be added to the data?

2. An Ethernet MAC sublayer receives 1510 bytes of data from the upper layer. How many frames are needed to be sent? What is the size of each frame?

3. Do the MAC addresses used in an 802.3 (Wired Ethernet) and the MAC addresses used in an 802.11 (Wireless Ethernet) belong to two different address spaces?

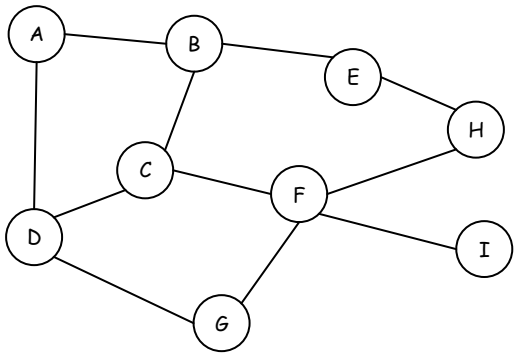
Circuit Switched Network

4. A path in a digital circuit-switched network has a data rate of 1 Mbps. The exchange of 1000 bits is required for the setup and teardown phases. The distance between two parties is 5000 km. We assume that the setup phase is a two-way communication and the teardown phase is a one-way communication. Answer the following questions if the propagation speed is 2×10^8 m/s:

   a) What is the total delay if 1000 bits of data are exchanged during the data transfer phase?
   b) What is the total delay if 1M bits of data are exchanged during the data transfer phase?
   c) Find the delay per 1000 bits of data each of the above cases and compare them. What can you infer?

Packet Switched Network – Datagram and Virtual Circuit

5. In the following network, assume: shortest path, no other data traffic, **Stop-and-Wait like operation**.
   - Suppose station A is the source station and station I is the destination station.
   - The message length (in terms of transmission delay) is 10 seconds.
   - The propagation delay per link is 1 second.
   - For circuit switching the set up time is 7 seconds.
   - For packet switching using datagram service, the packet size is 2 seconds and the nodal processing time is 0.5 second and no waiting time.
   - For packet switching using virtual circuit service, the set up time is 5 seconds.
   - Time for teardown can be ignored.
   - Further assume that all packets follow the same path ***and the size of the packet header could be ignored***.



   What is the end-to-end delay of transmitting the message from station A to station I?
   a) for circuit switching
   b) for packet switching using datagram service
   c) for packet switching using virtual circuit service