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CSC 335 Data Communications and Network I
Homework 3

1. What is multiplexing? Differentiate between frequency and time division multiplexing.

   Multiplexing is a way of breaking up a signal into multiple or separate parts. Frequency division breaks up the total bandwidth into section that all transmit at once, whereas time division gives the total bandwidth for a certain segment of time.

2. What are three important link layer services? Explain the problem of channel access (medium access control).

   Framing, Error Control, Flow Control. If multiple members try to fight over the same slot, the chance of one succeeding drops. 4 members or below is a fairly good chance, while 5 and above are 40% or below. This could result in some data not being transmitted when it should be and other issues such as collision.

3. Classify medium access control protocols.

   MAC protocols fall into one of two main classifications, distributed MAC protocols or centralized MAC protocols. They could then be further classified by mode of operation into random access protocols, guaranteed access protocols, or hybrid access protocols.

4. What are the main functions of the network layer in the Internet protocol stack?

   To transfer packets from a source network to a destination network, through one or more networks, via routing.

5. What is the structure for Ethernet packet and WiFi packet, respectively? What are the differences?

   Ethernet: Preamble, Start of frame delimiter, MAC destination, MAC source, Type, Data, CRC, Inter-frame gap.

   Wifi: Frame control, Duration, MAC Address 1(Destination), MAC Address 2(Source), MAC Address 3(Router), Seq Control, MAC Address 4(AP), Data, CRC.