Worksheet 16

1. List three different types of MAC protocols. Give example(s) for each type.

2. In Section 6.3 (Slide 6-19), we listed four desirable characteristics of a broadcast channel. (a) Which of these characteristics does TDMA have? (b) Which of these characteristics does slotted ALOHA have? (c)Which of these characteristics does token passing have?

3. In CSMA/CD, after the fifth collision, what is the probability that a node chooses $K = 4$? The result $K = 4$ corresponds to a delay of how many seconds on a 10 Mbps Ethernet?

4. Carrier sense and collision detection. Suppose nodes A and B are on the same 10 Mbps Ethernet segment, and the propagation delay between the two nodes is 225 bit times. Suppose at time $t=0$, B starts to transmit a frame. Suppose A also transmits at some $t=x$, but before completing its transmission it receives bits from B (hence, a collision occurs at A). Assuming node A follows the CSMA/CD protocol, what is the maximum value of x?

5. Consider a broadcast channel with N nodes and a transmission rate of R bps. Suppose the broadcast channel uses polling (with an additional polling node) for its multiple access. Suppose the amount of time from when a node completes transmission until the subsequent node is permitted to transmit (that is, the polling delay) is t_{poll}. Suppose that within a polling round, a given node is allowed to transmit at most Q bits. Further suppose node 1, initially with no bits to send, receives Q bits to send. What is the maximum time from when node 1 receives the bits until it can begin to send them?

6. Describe polling and token-passing protocols using the analogy of cocktail party interactions.