

## **Homework #10**

(Due Thursday, Jan 21<sup>st</sup>, 2016)

**Name three building blocks of Quality of Service?**

**Name and characterize four scheduling policies that were introduced in the lecture.**

**What are the criteria that policing mechanisms can use to control a data stream?**

**Illustrate in what sequence packets from three different queues (a, b, c) can be sent from a sending buffer that implements a WFQ scheduling policy. Suppose the weights for the queues are 0.25, 0.25, and 0.5. How could the sequence look like if there are no packets in queue 'c'?**

**Consider a token bucket that is filled with a rate of 1,000 tokens/min and has a size of 500 tokens. Each bit of data consumes one token. Does a flow of 20bps conform to this bucket?**

**Assume a router maintains QoS guarantees for two data flows. Flow a is policed by a token bucket with a capacity of 100 tokens a fill rate of 20 token/sec. Flow b is policed by a token bucket with a capacity of 200 tokens and a fill rate of 12 token/sec. The router uses weighted fair queuing to schedule the packets with a weight of 3 for flow a and a weight of 2 for flow b. It's sending rate is 40 packets/sec. What is the upper bound delay that the router can guarantee for both flows?**

**Briefly compare the IntServ to the DiffServ architecture.**