

**Q11.** (6 points) In ATM ABR congestion control the equation to increase the rate is given by:

$$Rate_{new} = Rate_{old} - Rate_{old} * RDF, \text{ where } RDF \text{ is the rate decrease factor,}$$

- a. discuss how fast/slow does the sender respond to congestion for the various value of  $RDF$ .
  - b. If the equation was changed to  $Rate_{new} = Rate_{old} * alpha$ , do you think the response will be better or worse and why.
- a. for high RDF the response will be fast, potentially causing oscillations. If RDF is low then the response will be slow.
- b. The response is very similar to part 'a'. Note that there is no difference in the mechanism if we put  $alpha = 1 - RDF$ .  
We get  $Rate_{new} = Rate_{old} - Rate_{old} * RDF = Rate_{old} (1 - RDF) = Rate_{old} * alpha$   
The rate of response will be reversed (as compared to part a above), i.e., when alpha is high (close to 1) the response will be slow, but when alpha is low (closer to 0) then the response is fast.