

EE 450 Homework 6
Spring 2013 Nazarian

Score: ___/100

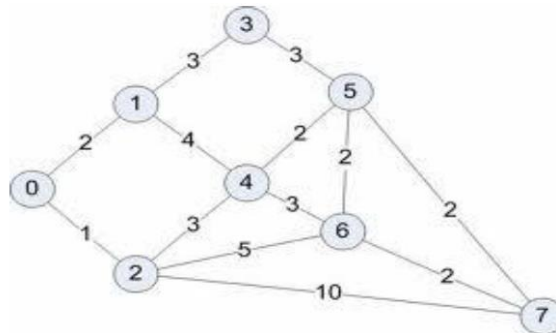
Student ID: _____

Name: _____

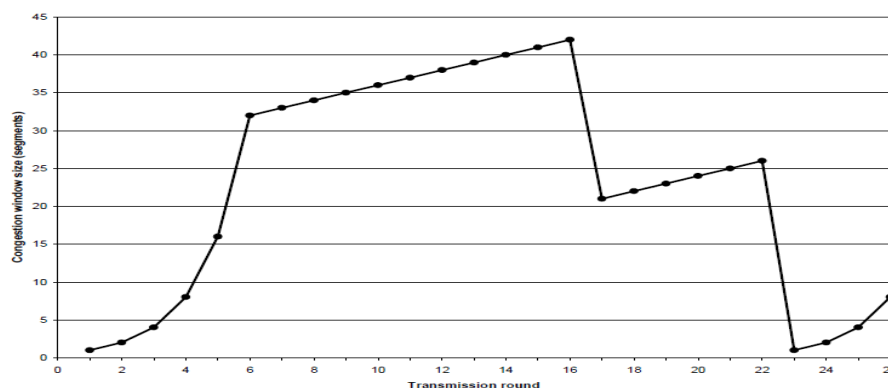
Assigned: Friday 4/12/2013

Due: Thursday 4/25/2013, at 5pm (EE450 HW locker, on the 3rd floor of EE Building.) Late submissions are accepted for one day only with a maximum penalty of 15%. This lets us post the solutions by Friday night so you will have the weekend before Midterm II to review them. For each day, submissions between 5pm-6pm: 2%, 6-7pm: 4%, 7-8pm: 8%. After 8pm: 15%. Since the graders may not be able to grade this homework before Midterm II, please make a copy of your work before submission in case you need to compare your answers with the posted solutions.

- 1) **Address Allocation (60 pts)** An ISP is granted a block of addresses represented by 243.1XY.116.0/14. XY is the last two digits of your student ID number. The ISP wants to distribute these blocks to 3000 customers as follows:
 - i. The first group has 50 small size businesses; each needs 70 addresses.
 - ii. The second group has 125 very small businesses; each needs 20 addresses.
 - iii. The third group has 2000 households; each needs 5 addresses.
 - a) Design the subblocks and give the slash notation and range of addresses for each subblock.
 - b) Find out how many addresses are still available after these allocations.
- 2) **OSPF using Dijkstra's Algorithm (20 pts)** Use Dijkstra's shortest path algorithm to compute the shortest path from 6 to all network nodes. Show how the algorithm works by creating a table similar to the one in lecture slides.



- 3) **Reno Network Congestion (20 pts)** Consider the following plot of TCP window size as a function of time.



Assuming TCP Reno is the protocol experiencing the behavior shown above, answer the following questions. In all cases, you should provide a short discussion justifying your answer.

- a) (5 pts) During which transmission round is the 64th segment sent?
- b) (15 pts) Plot the cumulative number of segments as a function of RTT transmission round; up to the 20th round.