**CS 455/555: Introduction to Networks and Communications**

**Spring 2016**

**Homework 1 - 2/11**

1. Do problem 25 in chapter 1. -12 pts
2. Do problem 28 in chapter 1. – 11 pts
3. 3. Using SMTP commands over telnet send yourself a message from someone else. Submit a printout of the commands you entered and the message you received in your mail program. – 11pts
4. Do problem 22 in chapter 2 – 11pts

**Homework 2 - 3/3**

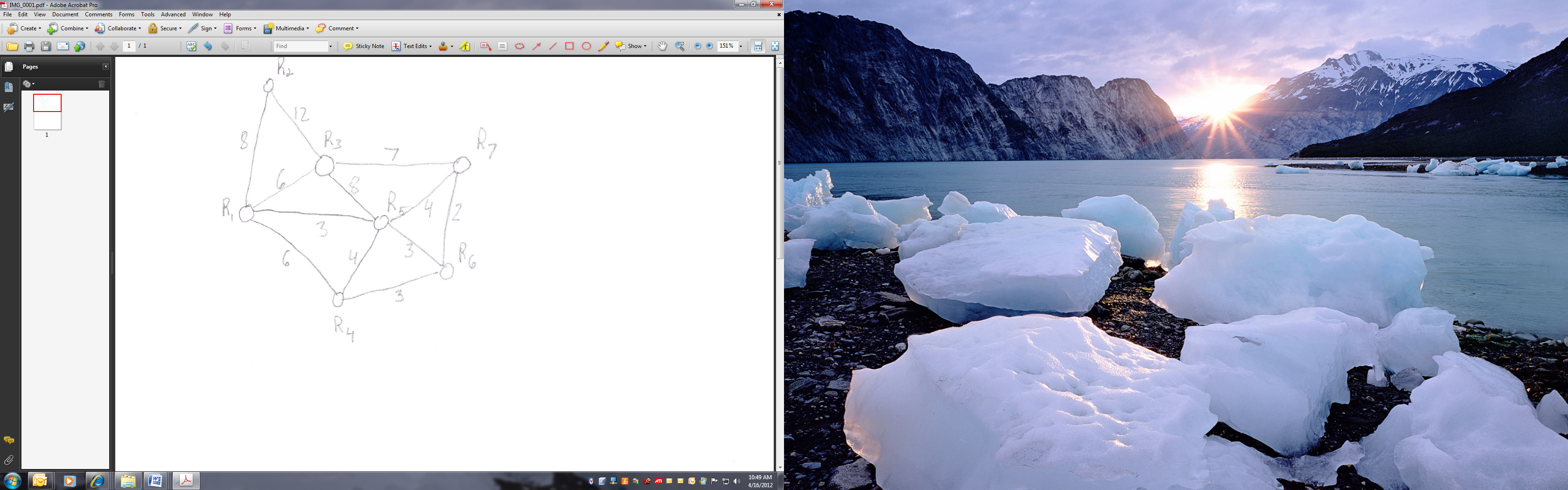
1. Do problem 3 in chapter 2 – 11pts
2. Describe – high level algorithms - the steps taken when a node leaves a P2P network gracefully. Assume that network is implemented as a doubly linked list, has one small-world link, one replica at successor – 12 pts
3. Do problem 9 in chapter 3 – 11 pts
4. Draw space/time diagrams for the cases of bit error and ack loss for the go-back n protocol– 11 pts

**Homework 3 - 3/24**

1. Illustrate the Go-back-n protocol when a delayed (causing time-out) Ack occurs. Use a space-time diagram and show the send window with markers for acked and sent. 11pts
2. Illustrate (space time diagram and window size) TCP’s congestion avoidance; assume MSS = 100 , current window size = 400 bytes and have segments 1-4 in the send window checked off for having been sent. Assume that no losses or corruptions occur -11pts
3. Why does a VC have different numbers for different links? Illustrate by showing the forwarding tables at two routers in a simple network with two VCs passing through each. – 11pts
4. Do problem 13 in chapter 4. Make the allocation a ‘good’ one. Also provide the network and broadcast addresses for the subnets and indicate how many more hosts can be added to the subnets you created. – 12 pts

**Homework 4 - 4/14**

1. Illustrate the process of running a webserver in a home network using static configuration of NAT router. - 11pts
2. Construct a center-based multi-cast spanning tree for the graph below assuming that R1 is the center, show intermediate steps. – 11 pts

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1. Do problem P14 in chapter 5. - 12pts
2. If there were no evil bit, what would the divisor in the fragmentation process be? – 6 pts
3. Why does the DHCP client do a broadcast ‘request’ ? – 5pts