

Comprehensive Examination in Computer Networks
Fall 2012

Work each of the following problems. You may NOT use a calculator or any other device. You must work on your own and you may not refer to any other material (books, notes, etc.) If the problem requires math, **show in detail how you obtain your answer** or your answer will not receive credit.

1. Name four functions that an ATM network performs but the IP network layer does not. I'm giving you one as an example. You may NOT repeat it.

a. Connection-setup _____

b. _____

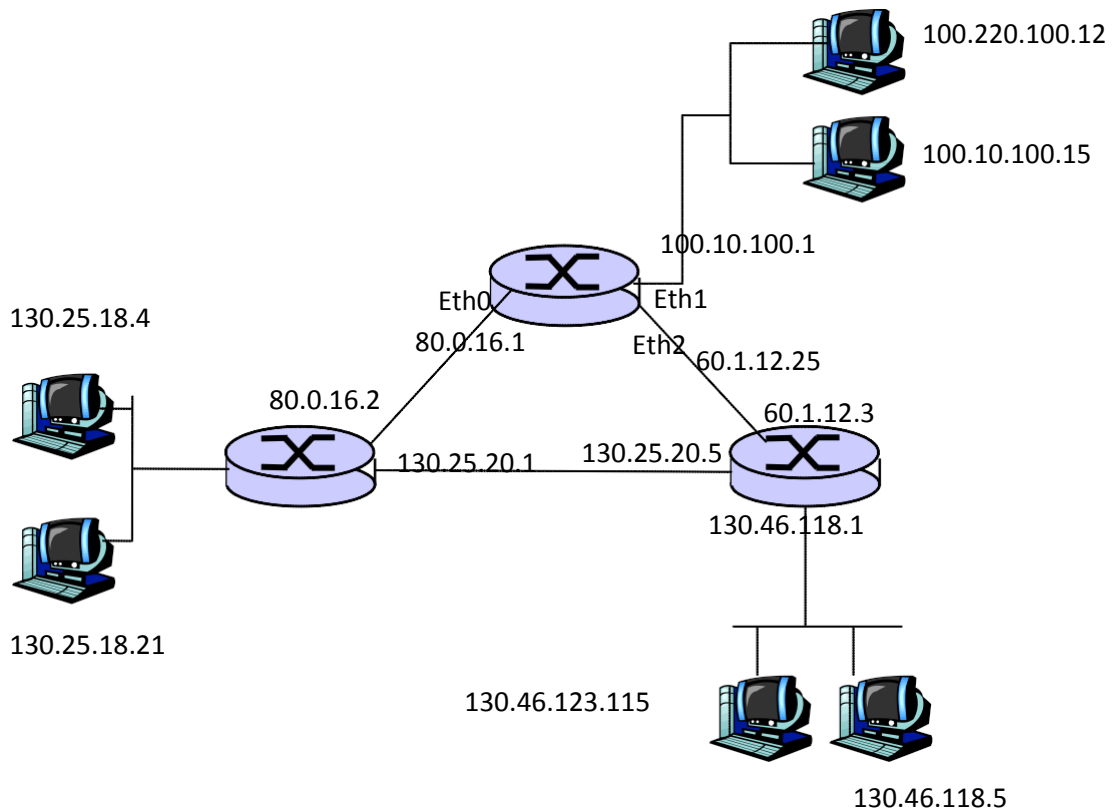
c. _____

d. _____

e. _____

- Two stations on an Ethernet LAN send frames that collide. Given that this one collision has occurred and that only these two stations transmit, what is the probability that exactly 5 collisions (4 additional collisions) will occur?

3. Create a routing table for the top-center router shown below. The table should contain exactly 5 rows as indicated. Do not use any default entry. Entries should be sufficient so that each IP address shown can communicate with all the other IP addresses shown (assuming that other routing tables are all properly defined.) NOTE: choose routes corresponding to fewest hops possible.



NETWORK ADDRESS	SUBNET MASK	NEXT

5. Answer each of the following:

a. Describe the TCP handshake. What is its purpose? What packets are transmitted and by which end of the connection?

b. What packet does a client send to a connected server in order to start the exchange of packets leading to connection takedown? How does the server respond?

c. What is TCP “slow-start”? Why is it used? (ANSWER BOTH PARTS.)

