

Computer Networks Comprehensive Examination Spring 2012

Work each of the following problems without use of a calculator or any reference material. Please explain fully and address the questions asked. (No credit will be given for extra information that does not answer the question.)

1. Compare the way ATM networks forward cells along an established connection with the way Internet routers forward packets along an established route. Be specific!

2. Respond to each of the following:
 - a. Describe the connection set-up procedure for a TCP connection (describe all datagrams exchanged).

- b. Describe the connection take-down procedure for a TCP connection (describe all datagrams exchanged).

3. Given the following list of 2-bit messages, construct a corresponding codeword list using 5-bit codewords such that the code's Hamming distance equals 3.

Message	Codeword
00	
01	
10	
11	

4. Answer each of the following:
- a. What mechanism does TCP/IP use to determine when it is time to resend a datagram containing TCP segment data?

 - b. If a datagram follows a 3-hop route (Host-Router-Router-Host) and the probability of discard is 0.1 at each router, what is the expected number of hops the datagram will make?

 - c. What is the length of the transmission time for a 1500 byte packet over a single 100 Mbps channel?

 - d. What are the classifications (types) of routing algorithms that are represented by OSPF, RIP and BGP?

 - e. Define the 3 acronyms from part d:

OSPF _____

RIP _____

BGP _____

5. Suppose a router is using the following routing table:

Subnet Number	Subnet Mask	Next Hop
128.96.170.0	255.255.254.0	Interface 0
128.96.168.0	255.255.254.0	Interface 1
128.96.166.0	255.255.254.0	Router 2
128.96.164.0	255.255.252.0	Router 3
(default)		Router 4

Describe what the router does when it receives a packet addressed to each of the following destinations.

a. 128.96.171.92

b. 128.96.167.151

c. 128.96.163.151

d. 128.96.169.192

e. 128.96.165.121