Name _____

CS3516 B14
Computer Networks
Final Exam
December 18, 2014

Question	Points	Score
0	1	
1	18	
2	8	
3	6	
4	4	
5	10	
6	4	
7	3	
8	5	
9	12	
10	10	
11	4	
12	16	
Total	100	

Trivia Question (1 extra credit point)

0.a   Excluding Rudolph name Santa's other reindeer (1/8 point per reindeer)?

or

0.b   What is the longest river in Thailand?

1   Fred, a bad guy, plugs his laptop into a Fast Ethernet in a computer lab.

(6 pts) 1a. Draw a diagram and explain how his laptop will use DHCP to acquire an IP address.

(4 pts) 1b. Fred then uses Wireshark on the LAN in promiscuous mode.   Later Mary sits down and attaches her laptop to the same LAN. Explain how Fred, if he and his computer are very quick, can conceivably use his knowledge of DHCP and use Wireshark to steal Mary's subnet IP address.

(3 pts) 1c. Discuss how Fred can now initiate a spoofing attack on the Internet and why he would want to do this as part of a DoS attack.

(5 pts) 1d.   Explain the difference in performance for Fast Ethernet between the LAN using a bus topology versus a Fast Ethernet switch.

(8 pts) 2. Draw two diagrams – one that shows Selective Repeat that uses ACKs and a second diagram showing Selective Repeat with NACKs. Assume cumulative ACKs. Briefly explain the differences in performance.

(4 pts) 3a. Explain how using sliding windows in protocols improve network protocol performance.

(2 pts) 3b. What is the advantage of piggybacking an ACK?

(4 pts)   4. Explain the difference between flow control and congestion control in TCP.

(10 pts) 5. Use diagrams to define and explain the two main mechanisms in TCP Tahoe.

(4 pts)   6. Explain the Karn/Partridge algorithm for determining RTO.

(3 pts)   7. Give an example of when hop count would be BAD a metric for a routing algorithm.

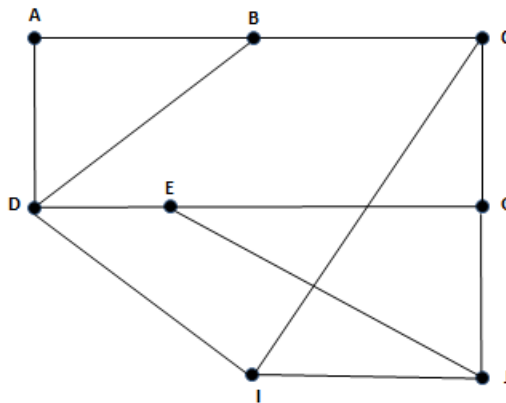(5 pts)   8. Explain why CIDR can be useful.

(8 pts)   9a. Compare the performance of token ring versus Ethernet under light and heavy loads.

(4 pts)   9b. Why did Ethernet win the battle of LANs over token ring?

(10 pts) 10. Draw a diagram and explain the role of a NAT when a client behind the NAT requests objects from a server out in the Internet.

(4 pts)   11. Discuss the characteristics of IEEE802.11a and 11b and explain why 11b was more popular to consumers.

(16 pts) 12. Given the network below and the three **distance vectors** received from node **J's neighbors,** fill in **J's** new **distance vector routing table**. Please show your work!

From E		From I		From G		Node	New Delay	Outgoing Line
Node	Delay	Node	Delay	Node	Delay	A		
A	23	A	29	A	14	B		
B	22	B	15	B	15	C		
C	25	C	5	C	2	D		
D	3	D	24	D	12	E		
E	0	E	16	E	9	G		
G	4	G	5	G	0	I		
I	21	I	0	I	6	J		
J	15	J	10	J	9			

JE's Delay is 2

JI's Delay is 5

JG's Delay is 7

Node J's Routing Table

Vectors received from J's three neighbors