EE 122 --- Spring, 1998

Midterm #1

1) True / False:

a) Using CRC-8, a receiver will detect *most* burst errors longer than 9 bits.

b) When the receiver detects an error using a CRC, it *will* discard the message if the error occurred in the message, but it will *not* discard the message f the error occurred in the CRC itself.

c) A CRC is preferable to an IP-like checksum because it is *easier* to compute in hardware.

d) Our analysis showed that *both* Ethernet and ALOHA maintain reasonably high utilization under high load, but that Ethernet achieves *higher* utilization.

e) The Distance Vector algorithm generally to take longer to converge than the Link State algorithm because of routing loops.

f) A new token is *always* generated when a new node joins an FDDI ring.

g) If one node or link on an FDDI ring fails, the ring *may* no longer be connected.

h) If synchronous data is limited to 0.5 TTRT in any round, the maximum TRT at any node will be approximately 1.5 TTRT.

i) Virtual paths are used to forward ATM cells across a non-ATM network (e.g. Ethernet).

j) The current Internet routing metric (Revised) is better than the previous metric (New) because it allows a *greater* range of link costs.

2) No question available.

3) No question available.

4) Four nodes are sending data on an FDDI network. Assume that each node has a fixed amount of synchronous data to send *every round* as shown in the table below, regardless of the token rotation time. Also, assume that all data is sent in 1KB *frames* (including headers). The amount of asynchronous data each node has to send and the token holding time for each node in the previous round are given in the table. No *new asynchronous data arrives*. Fill in the tables below for the next three rounds of the token. TTRT = 1.2ms, and the ring latency = 200μs. Assume that when we start Round 1 the token has just arrived at node A. (You must show your work to get credit).

Node	Synchronous Data *Each Round* (1KB frames)	Asynchronous Data (1KB frames)	THTx in Previous Round (us)
A	0	10	200
B	5	5	100
C	2	5	0
D	1	2	100

Round 1:

Node	TRT (us)	THT (us)	Synchronous Data Sent (KB)	Asynchronous Data Sent (KB)
A				
B				
C				
D				

Round 2:

Node	TRT (us)	THT (us)	Synchronous Data Sent (KB)	Asynchronous Data Sent (KB)
A				
B				
C				
D				

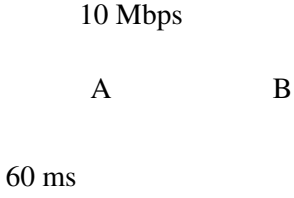
Round 3:

Node	TRT (us)	THT (us)	Synchronous Data Sent (KB)	Asynchronous Data Sent (KB)
A				
B				
C				
D				

5) No question available for part a) through c).

d) Assuming the link state algorithm were used instead of the distance-vector. How many rounds of updates would be needed before the algorithm would converge?

6) In the network shown below, node A has an infinite supply of 1KB packets to be sent too node B. Assume a sliding window protocol is used between A and B with SWS = RWS = 5.



a) Draw the protocol timing diagram until the ACK for the 5th packet is received at A, assuming the 3rd frame, and the ACK for the 2nd frame are dropped. You can indicate transmission delay simply by the spacing of your lines (i.e., you dont have to draw parallelograms). Your diagram should accurately depict the *order* in which events occur. You should assume a reasonable timeout value.

b) Compute the utilization from the start of transmission until the ACK for the 5th frame is received.

c) What would have been a better choice for SWS and RWS? Why?