

Data Communications CS420/520

Axel Krings

Midterm 2 -- Lecture 40 – Fall 2000

Name: _____ Student ID: _____

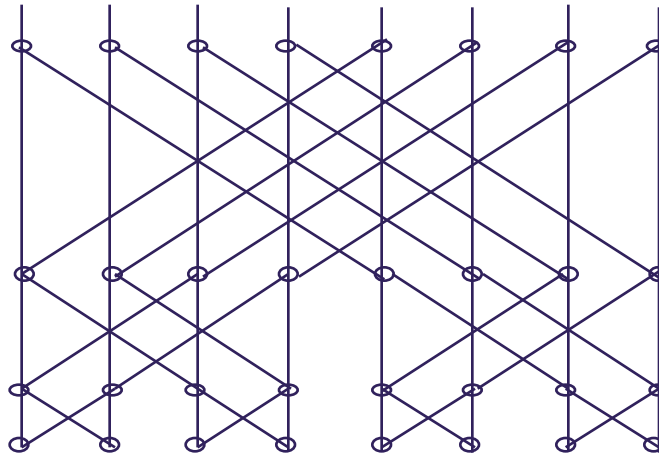
This is a *closed* book, *closed* note exam. You may use a calculator but **no computers**. Show **ALL** your work to get full or partial credit for the problem. You have 50 minutes.

Use the space provided – focus on the main issues and do not write long stories. If you need more space than provided, your answer is probably too long!

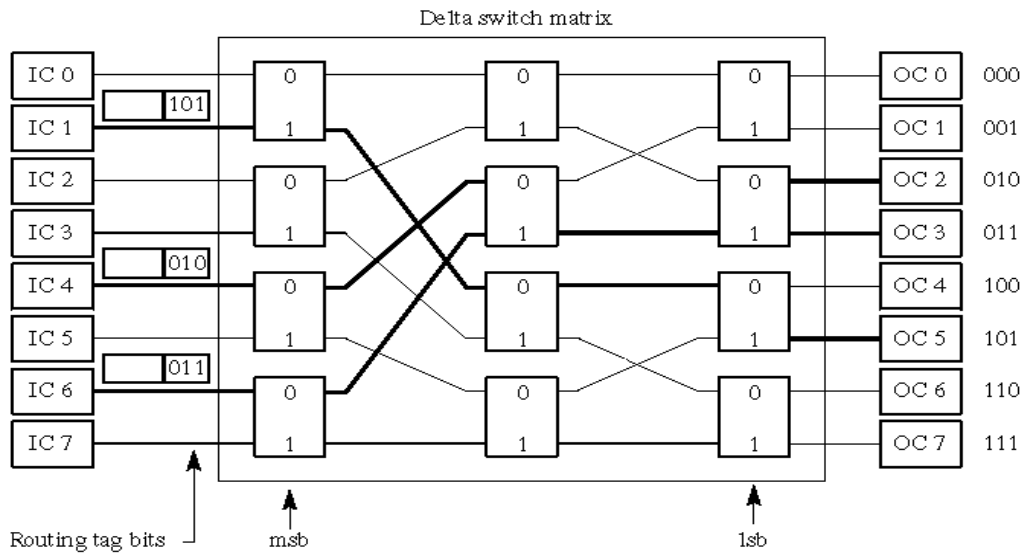
Problem	Total	Points
1	13	
2	20	
3	8	
4	20	
5	15	
6	12	
7	12	
Total:	100	

3. (8 pts) With respect to interconnection networks

- a) Is the Butterfly below blocking or non-blocking? If you select blocking, then prove this by giving an example.



- b) In the delta switch below, if a packet originating at IC0 has routing bits 110, which OC does it connect to? Indicate the route in the figure!



4. (20 pts) Answer the following questions briefly:
- a) (3 pts) Briefly describe the following terms
 - i) 10 Base 2

 - ii) 100 Base T

 - iii) 100 Base F

 - b) (4 pts) With respect to ISDN
 - i) What data rates are associated with the 3 channels?

 - ii) What is the D-channel used for?

 - c) (6 pts) Assume we have a Token ring network that is 1000m in length and operating at 100Mbps (100×2^{20} bits per second). The network has 80 stations each of which introduces a 1 bit buffer, and a monitor station which introduces a 27 bit buffer. The ring consists of _____ bits.

 - d) What is “Beaconing” in ring networks? Describe briefly how it works.

5. (15 pts) Answer the following questions:

a) With respect to CSMA/CD

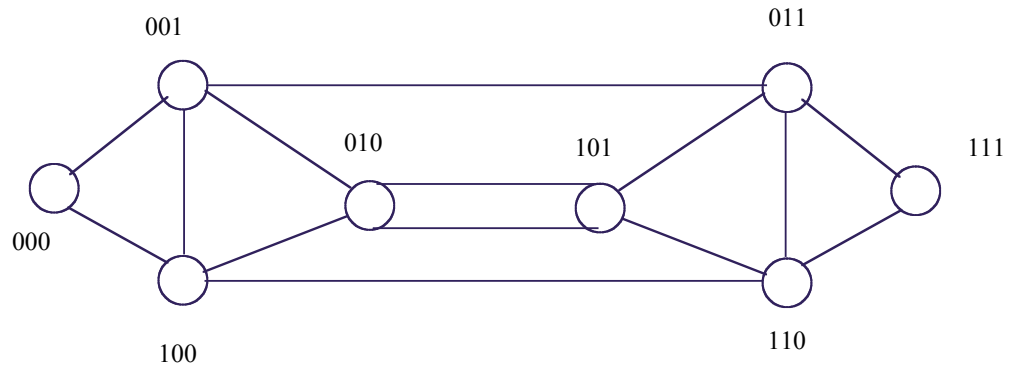
i) (2 pts) Is it used in broadcast or ring networks?

ii) (3 pts) If every station is sensing the carrier, how could there be collisions?

iii) (3 pts) How does collision detection work?

b) (4) How does Ethernet switching work, i.e. describe the function of a switch?

c) (3) What problem does Ethernet switching present with respect to network monitoring?



7. (12 pts) With respect to Internetworking
- a) (5) Indicate the number of bits used for the *netid* and the *hostid* for each of the following networks:
 - i) Class-A
 - ii) Class-B
 - iii) Class-C

 - b) (4) What is a *netmask*?

 - c) (4) How does one address all computers in a network (Note: I do not ask how to address the network, but the computers in the network!)

- d) What does one mean when talking about QoS (Quality of Service)? Point out at least two characteristics.