SONGKLA UNIVERSITY

FACULTY OF ENGINEERING

Examination : Mid Exam - Session 2	**Year** : 2003
Date : 24 Dec 2003	**Time** : 13.30-16.30
Subject : 240 – 361 Computer Networks	**Room** : R201, R300

Note

- There are 6 questions 8 pages (not include cover page). Answer all questions.
- All questions are of different values.
- Calculator, textbooks and hand-out are prohibited.
- Every answer must be clear and show how to get the answer.
- All answers must be given in ink.
- Unless otherwise indicated, pencils should only be used for graphical work.

Name :_____Student ID:_____Section:_____

Question	1	2	3	4	5	6	Total
Scores							

Student ID : Name: Section :

1. Consider sending a file 1000-KB from Host A to Host B. The network limits packets to a maximum size of 8 Kbits and each packet has a 30-byte header. There are 3 links between A and B. Each link transmits at 10 Mbps and is 1 km long. The network is lightly loaded so that there are no queueing delays. Assuming that the signal propagate at a speed of $2x10^8$ m/s and switches are store and forward.

   (i) ***How long does it take to send the file from source to destination if Stop-and-Wait ARQ is used?*** (5 marks)

Answer

(ii) *How long does it take to send the file from source to destination if Sliding window ARQ is used?* (5 marks)

Answer

2. Answer the following questions.

(i) ***Explain in detail the principles of CSMA/CD algorithm***. (2 marks)

Answer

(ii) Suppose nodes A and B are on the same 10 Mbps Ethernet segment. The propagation delay between the two nodes is 255 bit times. Suppose A and B send frames at the same time (at t = 0). They both detect collisions at t=255 bit times. They finish transmitting jam signal at t= 255+48 = 303 bit times. After the frames are collided, A and B choose different values of K in the CSMA/CD algorithm. Suppose K_A=0 and K_B= 1. Assuming no other nodes are active,

a. ***At what time does A begin retransmission?*** (2 marks)

Answer

b. ***At what time does B schedule its retransmission?*** (2 marks)

Answer

c. *At what time does A's signal(retransmission) reach B?* (2 marks)

Answer

d. *Does B refrain from transmitting at its scheduled time?* (2 marks)

Answer

e. *Can the retransmissions from A and B collide ?* (2 marks)

Answer

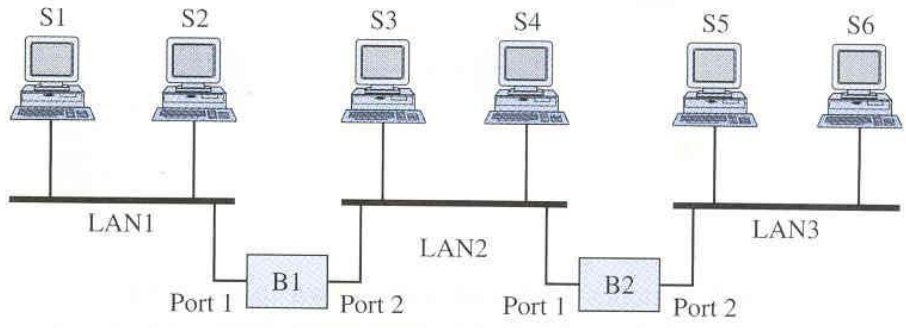
3. Graph the efficiency of slotted ALOHA and pure ALOHA as a function of p for N =100.

p : probability of transmissions

N : Number of Nodes (8 marks)

Answer

4. Six station (S1-S6) are connected to an extended LAN through transparent brigdes (B1 and B2), as shown in the figure. Initially, the forwarding tables are empty. Suppose the following stations transmit frames: S2 transmits to S1, S5 transmits to S4, S3 transmits to S5, S1 transmits to S2, and S6 transmits to S5. Fill in the forwarding tables with appropriate entries after the frames have been completely transmitted. (8 marks)



Answer

B1

Station	Port

B2

Station	Port

5. Suppose we want to transmit the message 11001001 and protect it from errors using the CRC polynomial x^3+1.

   (i) Use polynomial long division to ***determine the message that should be transmitted.*** (5 marks)

Answer

   (ii) Suppose the leftmost bit of the message is inverted due to noise on the transmission link. What is the result of the receiver's CRC calculation? ***How does the receiver know that an error has occurred?*** (3 marks)

Answer

6. Suppose some repeaters (hubs), rater than bridge, are connected into a loop.

(i) What will happen when somebody transmits? (2 marks)

Answer

(ii) Why would the spanning tree mechanism be difficult or impossible to implement for repeaters? (2 marks)

Answer