

King Fahd University of Petroleum and Minerals
 College of Computer Sciences and Engineering
 Department of Computer Engineering

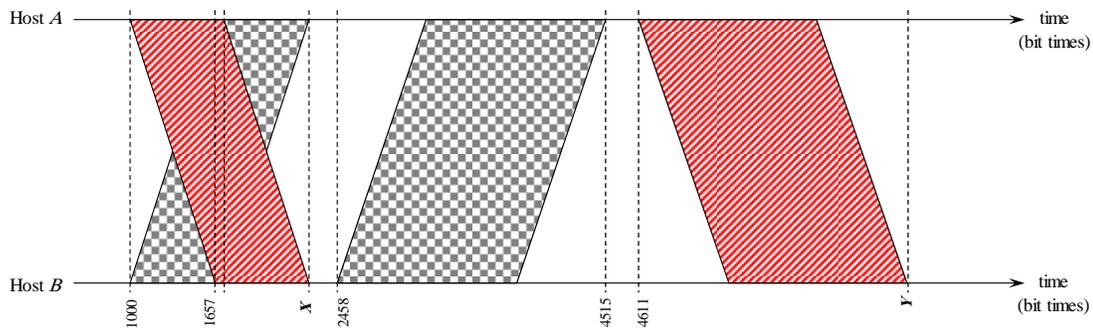
COE 344 – Computer Networks (T101)

Homework # 05 (due date & time: Sunday 09/01/2011 during class period)

Late homework submission will NOT be accepted

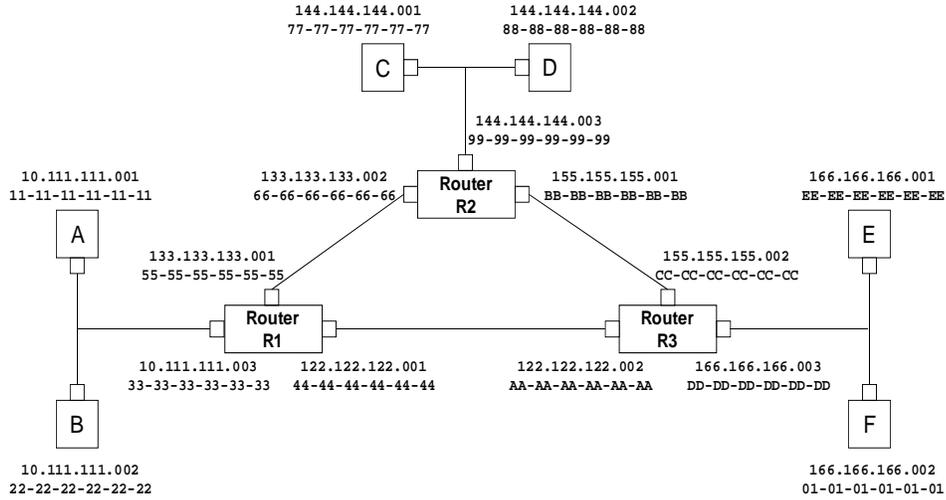
*** Show all your work. No credit will be given if work is not shown! ***

Problem # 1 (55 points): Consider the following exchange of Ethernet frames between nodes *A* and *B* over the same Ethernet segment. Suppose at time $t = 1000$ bit times, nodes *A* and *B* each transmit at the same time. Both *A*'s frame and *B*'s frame are of equal size.



- a) (5 points) Calculate the *propagation delay*.
- b) (10 points) Calculate the value of X .
- c) (10 points) Upon a successful transmission, calculate node *A*'s *transmission delay*.
- d) (5 points) Calculate the value of Y .
- e) (25 points) Calculate the value(s) of K in the CSMA/CD algorithm (i.e. the value(s) of K_A) that node *A* selects at the end of the collision shown in the given exchange that led to the successful transmission shown.

Problem # 2 (45 points): Consider the following network where host *A* wants to send a TCP segment to host *E*. The TCP segment sent by host *A* will pass through R1, then R2, then R3 before reaching host *E*. Assume that all ARP tables are complete except for router R1 (i.e. router R1 ARP table is empty). Complete the following table pertaining to the TCP segment sent from *A* to *E*. Note that the possible frame types are ARP Query, ARP Response, and data. Note also that the source and destination IP addresses refer to the IP addresses contained in the payload of each frame. (*Hint: There are a total of 6 frames that will be generated*)



Frame	Frame type	Source MAC	Destination MAC	Source IP	Destination IP
①					
②					
③					
④					
⑤					
⑥					