Dept. Math. & Comp. Sc.	Computer Networks
Vrije Universiteit	23.12.1999

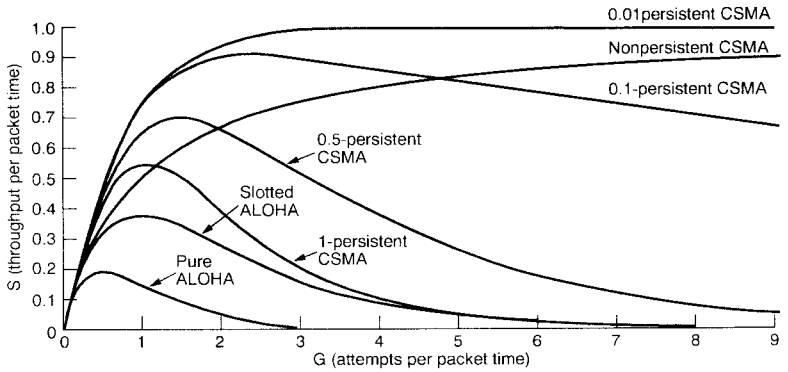
Part I

This part covers the same material as the midterm exam.

1a Why is it necessary, for example in Ethernet, to specify a *minimal* frame length? *10pt*

1b Explain the principle of p-persistent CSMA protocols. *5pt*

1c The figure below shows, for different random-access protocols, the channel utilization as function of the traffic. It appears that 0.01-persistent CSMA protocols are the best choice. Is this conclusion correct? *10pt*



2a What is the difference between *go-back-N* and *selective repeat* in sliding-window protocols? *5pt*

2b Why is it useful to have a large window size when dealing with slow connections such as with satellites? *5pt*

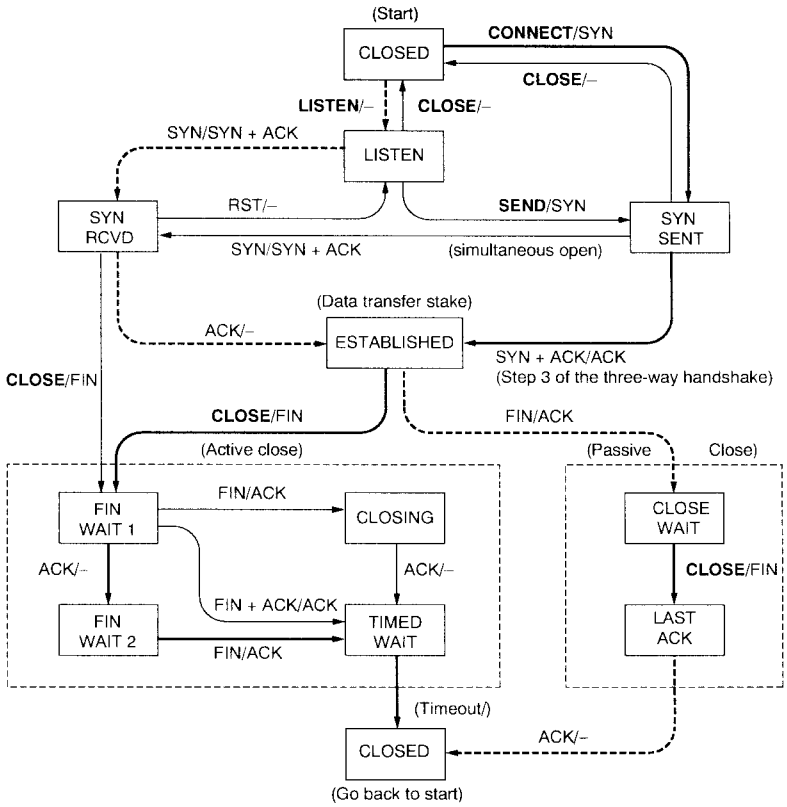
3 ATM cells consist of a 5-byte header and a 48-byte payload field. There are no cell delimiters such as, for example, flag bytes. How can a receiver know it has received a complete cell when all it gets is a stream of bits? *10pt*

Part II

4a Explain why TCP uses a congestion window in TCP, and how its size is determined. *5pt*

4b Explain how deadlock can occur in TCP when giving a *buffer credit grant*, and how that deadlock is generally resolved. *5pt*

4c The figure below shows the state-transition diagram for setting up and tearing down a TCP connection. The thick dashed line represents the normal path for a server; the thick solid line that of a client. What happens according to this diagram when the ACK sent by the client when changing state from "SYN SENT" to "ESTABLISHED," is lost? What happens normally in TCP? *10pt*



5a DNS supports iterative as well as recursive name look-ups. Explain the difference between the two. *10pt*

5b To off-load servers, DNS makes extensive use of *caches*. When will DNS caching *not* be effective? *5pt*

5c Give at least two methods other than name services like DNS, to look-up addresses in computer networks. Give an example of each method. *10pt*

Final grade: *(1) Add, per part, the total points. (2) Let T denote the total points for the midterm exam ($0 \leq T \leq 45$); $D1$ the total points for part I; $D2$ the total points for part II. The final number of points E is equal to* $\max\{T, D1\} + D2 + 10$.