

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

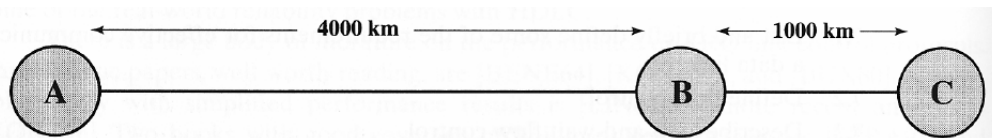
COE 342 – Data & Computer Communications (T042)

Optional Homework (due date: Sunday 29/05/2005)

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

Problem # 1 (30 points): In the figure below frames are generated at node A and sent to node C through node B. Determine the maximum data rate required between node A and node B so that the buffers of node B are not flooded, based on the following:

- The data rate between B and C is 900 kbps.
- The propagation delay is $5 \mu\text{s}/\text{km}$ for both lines.
- There are full-duplex lines between the nodes.
- All data frames are 1000 bits long; ACK frames are separate frames of negligible length.
- Between A and B a sliding-window protocol with a window size of 3 is used.
- Between B and C a stop-and-wait protocol is used.
- There are no errors.



Problem # 2 (30 points): For the same figure above, frames are generated at node A and sent to node C through node B. Determine the maximum window size for the sliding-window protocol between node A and node B so that the buffers of node B are not flooded, based on the following:

- The data rate between A and B is 100 kbps.
- The data rate between B and C is 150 kbps.
- The propagation delay is $5 \mu\text{s}/\text{km}$ for both lines.
- There are full-duplex lines between the nodes.
- All data frames are 1000 bits long; ACK frames are separate frames of negligible length.
- Between A and B a sliding-window protocol is used.
- Between B and C a stop-and-wait protocol is used.
- There are no errors.