

Topics Covered: Flow Control protocols: Stop and Wait, Sliding Window Control, GBN and Selective Repeat protocols

Question 1: In Go back-3 flow control protocol every 6th frame is lost. If we have to send 11 frames then how many transmissions will be needed?

Question 2: Host A is sending data to host B over a full duplex link. A & B are using the sliding window protocol for flow control. The sender and receiver window sizes are 5 frames each. Data frames (sent only from A to B) are all 1000 bytes long and the transmission time for such a frame is 50ms. Acknowledgement frames (sent only from B to A) are very small and require negligible transmission time. The propagation delay over the link is 200ms. What is the maximum achievable throughput in this communication?

Question 3: Explain the reason for moving from the Stop-and-Wait ARQ Protocol to the Go Back- N ARQ Protocol.

Question 4: Station A uses 32 byte frames to transmit messages to Station B using a sliding window protocol. The round trip time delay between A and B is 80ms and the bottleneck bandwidth on the path A and B is 128kbps. What is the optimal window size that A should use?

Question 5: Write about the three flow control protocols used for noisy channels along with their pros and cons?

Question 6: The distance between two stations M and N is L kilometres. All frames are K bits long. The propagation delay per kilometre is t seconds. Let R bits/second be the channel capacity. Assuming that processing delay is negligible, the minimum number of bits for the sequence number field in a frame for maximum utilization, when the sliding window protocol is used, is:

Question 7: Define piggybacking and its usefulness.

Question 8: Station A needs to send a message consisting of 9 frames to station B using a sliding window (window size 3) and Go back- N error control strategy. All frames are ready and immediately available for transmission. If every 5th frame that A transmits gets lost (but no ACK from B ever get lost) then what is the number of frames that A will transmit for sending the message to B?

Question 9: Compare and contrast the Go-Back-NARQ Protocol with Selective-Repeat ARQ.

Question 10: Frames of 1000 bits are sent over a 106 bps duplex link between 2 hosts. The propagation time is 25ms. Frames are to be transmitted into this link to maximally pack them in transit (within the link).

I. What is the minimum number of bits (l) that will be required to represent the sequence numbers distinctly? Assume that no time gap needs to be given between transmissions of two frames.