Digital Communication II

(a) The Transmission Control Protocol (TCP) employs a transmit window and cumulative acknowledgement and timeout system, as well as sequence numbering of packets, to achieve reliable delivery of data.

(i) Outline the procedure for round-trip time estimation and the calculation of the retransmission timer. [8 marks]

(ii) Explain the function of buffering at the sender and receiver. [3 marks]

(iii) How do fast retransmit and fast recovery improve performance after packet loss? [3 marks]

(b) In a wireless network, delay to access the channel due to scheduling of the media access control protocol, and random packet loss due to interference, may be non-negligible.

(i) Explain how this can interfere with the round-trip time estimation process above. [3 marks]

(ii) Explain how this can interfere with the congestion control scheme that TCP employs. [3 marks]