

CSE 30264 Computer Networks

Homework 2

Samantha Rack

P1. Original: 110101111101011111101011111110

With bit stuffing – if there are 5 consecutive 1s, sender inserts a 0

110101111100101111101010111110110

P2. (a) 0x48 = 0100 1000

parity bit = 1

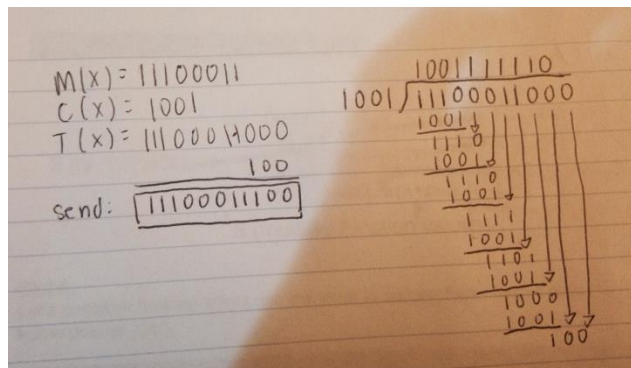
(b) 0x2A = 0010 1010

parity bit = 0

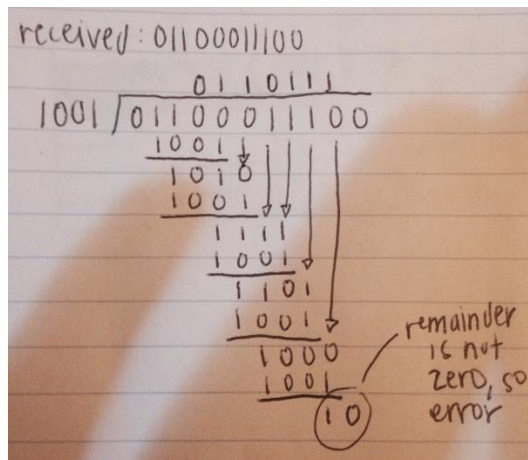
(c) 0x78 = 0111 1000

parity bit = 1

P3. (a)



(b)



P4. Bandwidth = 1e6 bits/s

Latency = 1.25s \rightarrow RTT = 2.5s

Size = 1KB = 1024bytes * 8 bits/byte = 8192 bits

BxD = 1e6bits/s * 2.5s = 2.5e6 bits

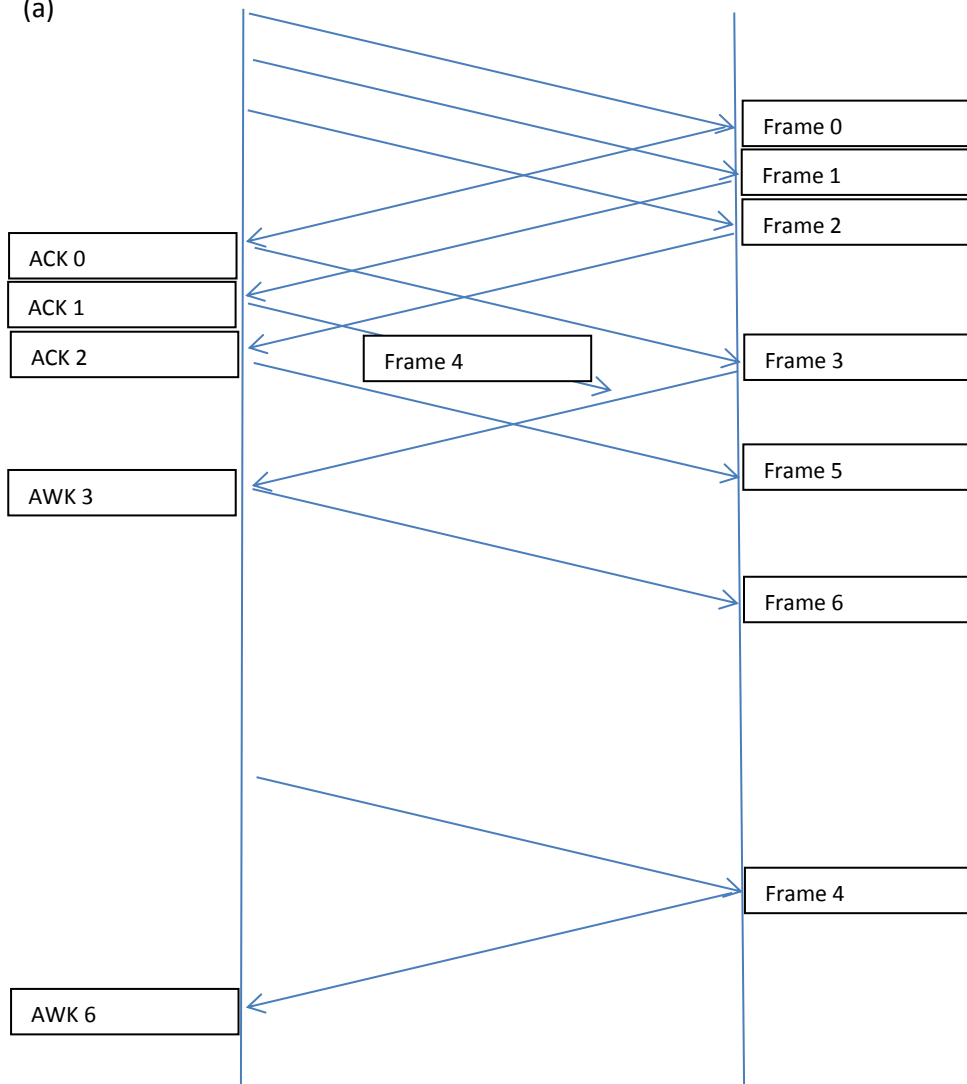
Packets = 2.5e6/8192 = 305

Sequence must be double the number of packets that can be in transit = $610 < 2^{10}$

10 bits needed

P5. Implementing flow control in this way would cause unnecessary messages to be resent. If the receiver waits to send an ACK message to the sender while its buffer is full, the sender's timeout clock will be counting down. When it expires the sender will assume that the message was not received, and the next message the sender will transmit will be redundant. Also, if an ACK message is lost in transmission back to the sender, then the receiver will not know that the buffer is no longer full.

P6. (a)



(b)

