Chapter 6 Philip Bock

6.1) Amount transferred: 10,000 Bytes = 80,000 bits Speed = 240 bps (a) 8 bit data, 2 bit overhead = 20% overhead Total Overhead = 80,000 * 0.2 = 16,000 bits = 200 BytesTime Overhead = 2,400 * 0.2= 480 bps(b) frame = 8,000 bits, ctrl pack is 48 bits 80,000 bits total / 8,000 bits / frame = 10 frames Overhead/frame = 48 (Ctrl pack) * 2 + 8 (flag) * 2 = 112 bits. Total Overhead = 112 (Overhead/frame) * 10 (Number of Frames) = 1120 bits Time Overhead = 1120 (Total Overhead) / 80,000 (Total Overhead) * 2400 bps (Data Rate) = 33.6 bps (c) 100,000 char * 8 bits/char = 800,000 Bits total transferred (8 bits / char) Total Overhead = 800,000 * 0.2 = 160,000 bits (a) = 20,000 Bytes Time Overhead = 2,400 * 0.2= 480 bps(b) Total Overhead = 112 (Overhead/frame) * 100 (Number of Frames) = 11,200 bits Time Overhead = 11,200 (Total Overhead) / 800,000 (Total Overhead) * 2400 bps (Data Rate) = 33.6 bps

(d) 10,000 characters = 10,000 * 8 (bits/char) = 80,000, 9600 bps

(a) Total Overhead = 80,000 * 0.2 = 16,000 bits = 2,000 Bytes Time Overhead = 9600 * 0.2 = 480 bps
(b) Total Overhead = 112 (Overhead/frame) * 10 (Number of Frames) = 1120 bits Time Overhead = 11200 (Total Overhead) / 80,000 (Total Overhead) * 9600 bps (Data Rate) = 134.4 bps

6.5) (8 bit data, (2 bit Stop + 1 bit Parity + 1 bit Start) = 4 bit Overhead) = 12 bit Total Packet)

49.9999 = Max BER %

 $49.9999 / (12 \text{ (bit Packet Total)} - 1) = 4.5454 = \max \text{BER \%}$

*Divisor is 11 since we only need the "Max BER" on the last bit.

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\begin{array}{l} 6.12) \\ P = 110011 \\ M = 11100011 = D \\ 110011 & 11100011 \\ 110011 \\ 00101111 \\ 110011 \end{array}
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11100 = CRC (check is CRC (L) = P (L) -1 = 6-1 = 5)

6.20)

| 0.20) | |
|---|---|
| 102 Signal Ground | 102 Signal Ground |
| 103 Transmit Data | 103 Receive Data |
| 104 Receive Data | 104 Transmit Data |
| 105 Request to Send | 105 Request to Send & Request to Send |
| 106 Clear to Send | 106 Clear to send |
| 109 Revd. Line sig. detector | 109 Rcvd. Line sig. detector |
| 107 DCE Ready | 107 DTE Ready |
| 108.2 DTE Ready | 108.2 DCE Ready |
| 125 Ring Indicator | 125 Ring Indicator |
| 113 Transmitter Timing | 113 Transmitter Timing |
| 115 Receiver Timing | 115 Transmitter Receiving |
| 105 Request to Send106 Clear to Send109 Rcvd. Line sig. detector107 DCE Ready108.2 DTE Ready125 Ring Indicator113 Transmitter Timing115 Receiver Timing | 105 Request to Send & Request to Send106 Clear to send109 Rcvd. Line sig. detector107 DTE Ready108.2 DCE Ready125 Ring Indicator113 Transmitter Timing115 Transmitter Receiving |