Understanding Communications Networks for Emerging Cybernetics Applications

First edition

Errata

Page 180

Problem 3.1, part (e), 20dBm should be changed to 40dBm

Problem 3.3, part b, -56dBm should be changed to -96dBm

Page 183

Problem 15 should be changed to **Problem 14**

Problem 14 should be changed to **Problem 15**

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Problem 15 should be changed to **Problem 16**

Problem 16 should be changed to **Problem 17**

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Problem 17 should be changed to **Problem 18**

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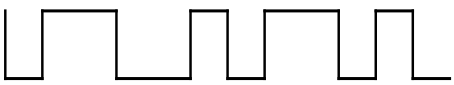
Problem 4.3

In the following differential encoded Manchester coded signal:



(a) Show the beginning and the end of each bit.

(b) Identify all the bits in the data sequence.

(c) Identify the bits if it was non-differential Manchester coded.

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Problem 6.6

a) Draw the 5-PAM and 5X5-PAM constellations. Show the probability of transmission and number of bits per symbol for each symbol in each of the two constellations.
b) For each constellation, calculate the average energy per constellation assuming minimum distance between the points is $d = 1$.
c) What is the difference in average energy in the two constellations in dB (10log of the ration of the two energies)?
d) What is the average number of bits per symbol for each constellation?

Problem 6.7

The PAM5X5 is commonly used in Ethernet LAN standards. Another alternative for this constellation, usually used in wireless LANs, is 16-QAM.

a) Draw the signal constellations for both. Show the probability of transmission and the number of bits associated to each symbol in each of the two constellations.
b) What is the average number of bits per symbol for each constellation?
c) If we use these constellations over two pairs of Cat-7 twisted pair (TP) wires with a bandwidth that accommodates transmission of 700Msymbol/sec, what would be the effective bit rate for each constellation?