

Computer Networks 22/23

Homework 3

Problem 1 (50%)

A signal is sampled two times each microsecond, into samples carrying 2 bits of information each. The communication channel has a bandwidth of 20 MHz and a signal to noise ratio of 30 dB.

- a) What data rate does the sampling provide?
- b) What is the maximum data rate of the channel? Note: the maximum data rate is the minimum of the two maximum data rates given by Nyquist and Shannon.

Problem 2 (50%)

Given the following bit sequences:

- A: 01101111
- B: 10000111
- FLAG: 01111110
- ESC: 11100000

show the transmitted bit sequence for data = FLAG A B ESC when using:

- a) byte count,
- b) flag bytes with byte stuffing,
- c) flag bytes with bit stuffing.