LAB 1

A certain digital system requires an E_b/N_0 of 3 dB at the receiver for an acceptable performance. The system is using spread spectrum technology and has a bandwidth of 1.25 MHz. The path loss for the channel is given as

$$PL = 72 + 30 \log(d)$$

Where PL is path loss in dB and d is the distance from the transmitter to the receiver in meters.

a) Calculate SNR for this system for transmit data rates of 10 and 100 Kbps.
b) Calculate the path loss for 100 and 500 meters.
c) What is the maximum cell range for a CDMA voice system with required sensitivity of -106.5 dBm, assuming that the power for the channel is 1 W and the transmitter antenna gain is 15 dB. (Note that received power is the total transmitted power (P_{tx}*antenna gain) minus the path loss.) Assunme that the handset antenna gain is 0 dB

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f = 870 + N x 0.03 MHz for N, the channel number, between 1 and 799, and

f = 870 + (N-1023) x 0.03 MHz for N between 999 and 1023.

Find the CDMA center frequency for the primary frequencies for A and B (channels 283 and 384 respectively) cellular bands.