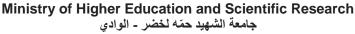
الجمهورية الجزائرية الديمقراطية الشعبية People's Democratic Republic of Algeria وزارة التعليم العالى والبحث العلمى





University Echahid Hamma Lakhdar, El-Oued

Technology Faculty Department of Electrical Engineering Speciality: Telecommunications

اختصاص: اتصالات سلكية و لا س

Analog Communications

Training Exercises 1

Exercise 1:

Convert the following power quantities to their correspondences in dB or dBm:

1k watt; 10kwatt; 10mwatt

Results: 30dB, 40dB, 10dBm

Exercise 2:

Calculate the ratio between the power of the signal Ps and that of the noise P_b to get a signal-to-noise ratio SNR = 3dB.

Same question for: (SNR=-3dB); (SNR=0dB), (SNR=10dB), (SNR=20dB).

Results: $P_s=2 P_b$, $P_s=0.5 P_b$, $P_s=P_b$, $P_s=10 P_b$, $P_s=100 P_b$.

Exercise 3:

Calculate the theoretical capacity C (the maximum data rate) for a signal with a channel whose bandwidth W is 12 MHz and the signal-to-noise ratio SNR is 30 dB. Same question for: (W=2 MHz and SNR=12dB); (W=10 kHz and SNR=9dB); (W=3 kHz and SNR=100watt).

Result: 119 Mbps

Exercise 4:

Calculate the Signal/Noise Ratio (SNR) in decibel for a transmission line (channel) with a maximum data rate of 100Kbit/s and a bandwidth of 20kHz?

Same question for: (C=30Kbits/s and W=100KHz); (C=2Mbits/s and W=5MHz).

Result: SNR=14.9dB

Exercise 5:

Calculate in decibel the power of a signal transmitted over a channel whose a bandwidth of 40 kHz and with maximum data rate of 40kbit/s, knowing that the power of the noise is 5dB.

Same question for: (C=1Kbits/s and W=500Hz); (C=1Mbits/s and W=1kHz).

Result: P_s=5dB.

Good Luck: Dr. GHENDIR Said