Problem 1

Assume a Zero – IF receiver for GSM900 with 3.3V p-p oscillator driving the 50 ohms mixer port. The LO leakage is -85dB and LNA has of 12dB. The RF filter loss is 2dB. Estimate the difference in power levels of the desired channel and the DC-level at the output of the mixer. (The received signal power at the Antenna is -102dBm)

Problem 2

A device under test is connected as shown to calculate its noise figure (NF). The total output voltage due to noise was found to be 1.9 nV\text{rms}/\text{VHz}. Calculate the NF.

Problem 3

For GSM receivers, the signal level at the antenna is between -102dBm and -43dBm. To satisfy the required BER, SNR at the demodulator input is at least 9dBm. The signal bandwidth is 200kHz. Find the maximum NF for the RF section.
**Problem 4**

Find the total noise factor for the cascaded blocks shown below.

![Diagram of cascaded blocks](image)

**Problem 5**

A non-linear block has a gain of 0dB (unity gain), and IP3 of 10dBm. Two sine waves of magnitude -10dBm each are put in the input of the block. Calculate the intermod power at the block output.