

Name: _____

Section: _____

EE334 Homework: Noise

Problems:

- Do the problems on the attached pages (pages 2-4).

Additional Problems (Instructor Option):

- Any as assigned by instructor

#1 – Describe (in detail) the internal sources of noise for a communications system. Discuss over what frequencies the different types of noise dominate and describe what can be done to minimize their effects.

- #2 – An AM receiver has a 100 Ohm input resistance and operates at 25 degrees C. The receiver bandwidth is 10 kHz. The signal input power to the receiver is 12.4 fW.**
- a.) Find the open circuit noise voltage.**
 - b.) Find the noise power.**
 - c.) Calculate the $\text{SNR}_{\text{input}}$ as a ratio and in dB.**

#3 - The SNR at the input to a two stage amplifier is 200 and the SNR at the output of the first stage amplifier is 100. The power gain of the first amplifier stage is 120, the gain of the second amplifier stage is 100, and the noise ratio of the 2nd amplifier is 4.

- a.) Calculate the noise ratio and noise figure of the first stage amplifier.**

- b.) Calculate the total Gain, NR, NF, and output SNR of the composite two stage amplifier.**