University of Rhode Island Department of Electrical and Computer Engineering ELE 435: Communication Systems

## PCM Encoding and Decoding Report and Grading Format

## 1 Report Format

- 1. Briefly explain the procedure (what you did in the lab)
- 2. Show the Results/plots, you can use excel or a snap shot or draw it by hand. If you draw it by hand, it might be cumbersome. Following are some general guidelines. You dont have to follow the same format, but it will be good to see these results/plots.
- 3. For the Matlab Code, Comment on the main commands you used in the code. Justify why you used these particular set of commands.
- 4. Answer the following questions
  - (a) Define the following terms
    - i. PAM
    - ii. PCM
    - iii. Companding, A-law,  $\mu$ -law
    - iv. Quantization
    - v. Frame Synchronization (FS)
    - vi. Time Division multiplexing (TDM)
  - (b) What are the basic operations needed to generate a PCM signal? Briefly describe them.
  - (c) Block Diagram for PCM. Briefly describe individual blocks.
  - (d) List some of the Practical PCM circuits. Briefly describe any two circuits.
  - (e) What is the Bandwidth of a PCM signal (its different for different pulses)
  - (f) What are the terms
    - i. Peak Signal Power to total Average Noise Power
    - ii. Average Signal power to Average Noise power,
    - iii. SNR and SNDR.
  - (g) List and briefly elaborate on the different categories of Quantization noise.