

### **MATLAB PROJECT**

**Project Objective:** Converting an analog waveform into digital stream (PCM signal)

Deadline: Thursday, 21 December 2023

Teamwork: Groups, each group of two students

Grade: 10 Marks

**Assumptions:**

Consider the analog waveform is a sinusoidal signal with frequency 20Hz and used a uniform quantizer of 16 levels.

**Requirements:**

1. Plot the analog signal, the sampled version and find the PCM signal if the sampling rate equals the Nyquist rate. Also, determine the bit rate of the PCM signal (from MATLAB code and compare with the analytical value)
2. Repeat 1) if the sampling rate is twice the Nyquist rate and compare between the results with part 1 (compare with respect to the quality of the sampled signal and the output bit rate).
3. Try to reconstruct the original waveform from the PCM signal for the above two cases, then comment on your results and justify your answers

Best Wishes

Dr. Nora Ahmed Ali