Project Statement:

An analog message "$m(t)$=5cos20πt+4sin10πt" is given. The following tasks have been completed.

Task 1: Sampling the message using a sampling frequency of 100Hz, quantizing it using round off technique with a quantization level of L=256 and converting it into a PCM signal by assigning necessary bits to each quantization level.

Task 2: Modulation of the PCM bitstream using M-ary QAM modulation scheme by taking M=16.

Task 3: Addition of additive white Gaussian noise of 10dB with the QAM modulated signal.

Task 4: Designing a QAM demodulator to demodulate the above noisy modulated signal and recover the PCM bitstreams from it. Also comparing it with the actual PCM bitstream and report the probability of bit error.

Task 5: From the recovered PCM bitstream, recovering the quantized form of the analog message $m_q(t)$ and comparing it with the actual quantized message and report the error signal.