Experiment No : 11

Name of the Experiment: Write a MATLAB program for Pulse Amplitude Modulation (PAM) and Demodulation.

Objective(s):

① To understand and simulate the concept of pulse Amplitude modulation (PAM) and Demodulation.

Theory: Pulse Amplitude modulation (PAM): Pulse Amplitude modulation (PAM) is a modulation technique where the amplitude of carrier signal is varied in accordance with the instantaneous amplitude of the message signal.

In digital communication, PAM is used to transmit digital information over analog communication channels.

Demodulation: Demodulation involves extracting the original message signal from the modulated signal.

Algorithm:

a. PAM modulation:

step-1: Generate a digital message signal consisting of binary data (0s and 1s).

step-2: Define a carrier signal with a specified frequency and amplitude.

step-3: Perform PAM modulation by multiplying the carrier signal with the message signal.

step-4: Plot the PAM-modulated signal in the time domain.

b. Demodulation of PAM signal:

Step-1: Design a demodulation process to recover the message signal from the PAM-modulated signal.

Step-2: Used low pass filter to eliminate high-frequency component.

Step-3: Perform threshold detection to convert the baseband signal.

Step-4: Plot the recovered message signal and compare it with the original message signal.

Advantage:

(i) Bandwidth Efficiency.
(ii) Simplicity.
(iii) Robustness Against Phase Distortion.

Disadvantage:

(i) Limited Symbol Rate.
(ii) Lower noise Immunity.
(iii) Limited Error detection/Correction.