**Experiment No.: Date:**

**Aim:** To study Delta Modulation and Demodulation using Matlab

**Theory:**

Delta modulation transmits only one bit per sample instead of N bits transmitted in PCM. This reduces its signaling rate and bandwidth requirement to a great extent. The original signal and its staircase representation are compared to produce a difference signal. This difference signal is quantized into two levels namely δ. If x’(t) lies below x(t) at sampling instant then the signal is increased by δ. If x’(t) is greater than x(t) at the sampling instant, then x’(t) is decreased by δ.

X (n ts) is applied to the input. Staircase of value X’ (n ts) is produced.

The error produced is given by:

E (n ts) = X (n ts)- X’ (n ts)

The error is then quantized into a single bit and the quantizer output is transmitted as D.M. signal.

**Advantages:**

1. Low signaling rate.
2. Low transmission channel bandwidth.
3. The delta modulator transmitter and receiver are less complicated.

**Disadvantages:**

1. Slope overload error and granular noise is present.
2. Signaling rate with no slope overload error is higher.

**Applications:**

1. Digital communications.
2. Digital voice storage.

**Conclusion:**