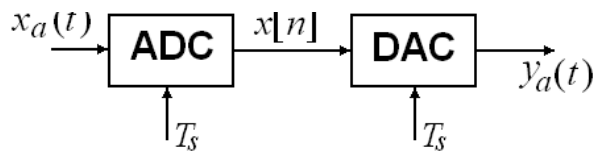


Impact of phase on the Sampling and Reconstruction of Signals

Objectives:

- (a) Generate discrete-time sequences from analog signals with various phase angles.
- (b) Determine analog signals from discrete-time sequences using various Interpolation filters
- (c) Study the effect of phase on reconstruction signals.



Task1: Consider an analog signal $x_a(t) = \cos(20\pi t + \phi)$, $0 \leq t \leq 1$. Let $\phi = 0, \pi/6, \pi/4, \pi/3$ and $\pi/2$. Plot $x_a(t)$ and its spectrum.

Task2: This analog signal is sampled at $T_s = 0.05$ sec intervals to obtain $x[n]$. Compute $x[n]$ from $x_a(t)$ for all the phase values. Plot $x[n]$ and its spectrum.

Task3: Reconstruct the analog signal $y_a(t)$ from the samples of $x[n]$ using (a) Sync (b) Cubic Spline interpolation filters and super impose $x[n]$ on it. Use $\Delta t = 0.001$ sec. Plot the signals and their spectrum.

Task4: Observe the resultant construction in each case that has the correct frequency but different amplitude. Explain these observations. Comment on the role of phase of $x_a(t)$ on the sampling and reconstruction of signals.

- | | | |
|-------------------------|-----------|--------------------------------------------------------------------------|
| 1. M. Pujitha | 150030588 | pujithamodugula@gmail.com |
| 2. Sahil Afrid Farookhi | 150030590 | msafarookhi@gmail.com |
| 3. M. Chandini Sushma | 150030613 | chandinisony912@gmail.com |