DSP LAB

- Generating elementary signals like Unit Step, Ramp, Exponential, Sine, and Cosine sequences.

- Demonstrates the effect of sampling, aliasing.

- Show that the highest rate of oscillation in a discrete-time sinusoidal is obtained when $\omega=\pi$.

- Consider the continuous-time analog signal $x(t)=3\cos(100\pi t)$. Sample the analog signal at 200 Hz and 75 Hz. Show the discrete-time signal after sampling. $\Longrightarrow$ realization.

- Consider the analog signal: $xa(t)=3\cos(200\pi t)+5\sin(600\pi t)+10\cos(1200\pi t)$. Show the effect of sampling rate.

- The impulse response of a discrete-time LTI system is $h(n)=\{u(n)-u(n-5)\}$. Determine the output of the system for the input $x[n]=u(n)$, using the convolution sum.

- Given $x(n)=[1,3,-2,4]$ $y(n)=[2,3,-1,3]$ $z(n)=[2,-1,4,-2]$

Find the correlation between x(n) & y(n) and y(n) & z(n). $\Longrightarrow$ observe the realization.

- Filter realization using 6-point averaging, 6-point differencing equations.

- DFT of $xa(t)=\sin(2\pi\cdot1000t)+0.5\sin(2\pi\cdot2000t+4\pi)$. Also IDFT. DFT with window + window function realization.

- Design a low pass FIR filter to remove high-frequency noise from a signal using convolution.