1	a) Write and execute a program using MATLAB to verify sampling theorem for a continuous time signal $\boldsymbol{x(t) = \cos(2\pi f_m t)}$ or $\boldsymbol{x(t) = \sin(2\pi f_m t)}$ of suitable frequency with respect to following conditions i) Over -Sampling ii) Under- Sampling iii) Nyquist Sampling. b) Write a C program to obtain the linear convolution of two finite sequences x(n) and h(n) and realize using DSP Processor.(x(n) and h(n) will be given)
2	a) Using MATLAB find the response y(n) of a given LTI system whose impulse response **h(n) = [1, 2, 2, 1]** with time index (-1 : 2) for an input **x(n) = [1, 2, -3, -4]** with index **(-2:1).** b) Write and verify a C program that obtains the circular convolution of two sequences x(n) and h(n) and realize using DSP Processor (x(n) and h(n) will be given)
3	a) Using MATLAB obtain the linear convolution of the two given sequences using DFT and IDFT method. **x(n)=[1,-1 ,1]** and **y(n)=[1, 2].** b) Write and verify a C program that obtains the circular convolution of two sequences x(n) and h(n) and realize using DSP Processor (x(n) and h(n) will be given)
4	a) Using MATLAB obtain the Auto correlation of finite duration sequence and verify its properties. b) Write and verify a C program that obtains the circular convolution of two sequences x(n) and h(n) and realize using DSP Processor (x(n) and h(n) will be given)
5	a) Using MATLAB obtain the cross correlation of finite duration sequences and verify its properties. b) Using MATLAB design and implement a digital **low pass** filter H(z) that when used in an A/D-H(z)-D/A structure gives an equivalent analog filter with following specifications i) Monotonic Pass Band and Stop Band ii) Pass Band Ripple ≤ 3.01dB iii) Pass Band Edge: 500Hz iv) Stop Band attenuation ≥ 15dB v) Stop Band Edge: 750Hz vi) Sample rate of 2KHz
6	a) Computation of N point DFT of a given sequence and to plot magnitude and phase spectrum using MATLAB b) Solve the following difference equation for y(n) making use of specified initial conditions and the input x(n). **y[n] - (1/2) y[n-1] = x[n]**; n≥0 and **y[-1] = 1/4**. Find the response of the system to the input **x[n] = sin(0.5πn)** using MATLAB.
7	a) Using MATLAB obtain the linear convolution of the two given sequences using DFT and IDFT method. **x(n)=[1,-1 ,1]** and **y(n)=[1, 2].** b) Find the N-Point DFT of a sequence **x(n) = [1, -2, -2, 1]** using CC studio and realize using DSP Processor.
8	**a)** Using MATLAB design and implement a **High Pass FIR Filter** using a **rectangular window of size N=5.** with the following desired frequency response. $H_d(e^{jw}) = 0 \quad ; \ \|w\| \le \pi/4$ $= e^{-jw(N-1)/2} \ ; \ \pi/4 \le \|w\| \le \pi$ b) Obtain the impulse response of the given LTI system **y[n] - (1/2) y[n-1] = x[n]** using CC studio and realize using DSP Processor.
9	a) Design FIR Low Pass filter using Hamming window for the specifications given i)Pass band frequency 100 Hz ii)Stop band frequency 200 Hz iii) Sampling Frequency 1000 Hz b) Obtain the impulse response of the given LTI system **y[n] - (1/2) y[n-1] = x[n]** using CC studio and realize using DSP Processor.

10	a) Using MATLAB design and implement a digital **low pass** filter H(z) that when used in an A/D-H(z)-D/A structure gives an equivalent analog filter with following specifications. i) Ripple in Pass Band and Monotonic Stop Band ii) Pass Band Ripple ≤ 2dB iii) Pass Band Edge: 100Hz iv) Stop Band attenuation ≥ 20dB v) Stop Band Edge: 500Hz vi) Sample rate of 4KHz. b) Find the N-Point DFT of a sequence **x(n) = [1, -2, -2, 1]** using CC studio and realize using DSP Processor.
11	a) Using MATLAB obtain the circular convolution of the two given sequences using DFT and IDFT method. **x(n)=[1,-1 ,1]** and **y(n)=[1, 2].** b) Write a C program to obtain the linear convolution of two finite sequences x(n) and h(n) and realize using DSP Processor.(x(n) and h(n) will be given
12	a) Write and execute a program using MATLAB to verify sampling theorem for a continuous time signal $\boldsymbol{x(t) = \cos(2\pi f_m t)}$ or $\boldsymbol{x(t) = \sin(2\pi f_m t)}$ of suitable frequency with respect to following conditions i) Over -Sampling ii) Under- Sampling iii) Nyquist Sampling. b) Obtain the impulse response of the given LTI system **y[n] - (1/2) y[n-1] = x[n]** using CC studio and realize using DSP Processor.
13	a) A causal discrete LTI System is described by **y[n] - (3/4) y[n-1] + (1/8) y[n-2] = x[n]** where x[n] and y[n] are the input and output of the system respectively. Find the **Impulse response** h[n] of the system using MATLAB. b) Write a C program to obtain the linear convolution of two finite sequences x(n) and h(n) and realize using DSP Processor.(x(n) and h(n) will be given)
14	a) A causal discrete LTI System is described by **y[n] - (3/4) y[n-1] +(1/8) y[n-2] = x[n],** where x[n] and y[n] are the input and output of the system respectively. Find the **Step response** s[n] of the system using MATLAB. b) Write and verify a C program that obtains the circular convolution of two sequences x(n) and h(n) and realize using DSP Processor (x(n) and h(n) will be given)
15	a) A causal discrete LTI System is described by **y[n] - (3/4) y[n-1] + (1/8) y[n-2] = x[n]** where x[n] and y[n] are the input and output of the system respectively. Find the **response** y(n) of the system to the input **x[n] = sin(0.5πn)** using MATLAB. b) Construct a Simulink model of a FIR LPF for given specifications and observe the time domain waveform and spectrum of filtered signal.