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| **EXPERIMENT TITLE: Write a program to plot the following function a) impulse function b)unit step c)unit ramp d)expnentional e)sinusoidal** | EXPERIMENT NO: GEC-LM- EC-311LA -01 |
| ISSUE NO : 001 | ISSUE DATE  | 19-12-2013 | REV NO: 003 | REV DATE  | 14-01-2021 |
| DEPARTMENT: | ECE | LABORATORY: | DSP | SEMESTER: | 5TH |

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| **AIM: Write a program to plot the following function a) impulse function b)unit step c)unit ramp d)expnentional e)sinusoidal.****PROCEDURE:-** * Open MATLAB
* Open new M-file
* Type the program
* Save in current directory
* Compile and Run the program
* For the output see command window\ Figure window

**PROGRAM:-**clc;clear all;close all;t= -2:1:2;y= [zeros(1,2),ones(1,1),zeros(1,2)];subplot(2,2,1);stem(t,y);ylabel('Amplitude');xlabel('(a) n-->');n= input('Enter the N value');t= 0:1:n-1;y1=ones(1,n); subplot(2,2,2);stem(t,y1); ylabel('Amplitude-->');xlabel('(b) n-->');n1= input('Enter the length of ramp sequence');t= 0:n1;subplot(2,2,3); stem(t,t);ylabel('Amplitude-->');xlabel('(c) n-->');n2= input('Enter the length of exponential sequence');t= 0:n2;a= input('Enter the a value');y2= exp(a\*t); subplot(2,2,4);plot(t,y2);ylabel('Amplitude-->');xlabel('(d) n-->');t=0:.01:pi;y= sin(2\*pi\*t); figure(2);subplot(2,1,1);plot(t,y);ylabel('Amplitude-->');xlabel('(a) n-->');t=0:.1:pi;y= cos(2\*pi\*t); subplot(2,1,2);plot(t,y);ylabel('Amplitude-->');xlabel('(b) n-->');**RESULT :-Thus the MATLAB program to plot a function was verified.****OUTPUT:-** |

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| **EXPERIMENT TITLE: Write a program to plot real part, imaginary part, magnitude and phase spectra of an exponential function.** | EXPERIMENT NO:- GEC-LM- EC-311LA -02 |
| ISSUE NO : 001 | ISSUE DATE  | 19-12-2013 | REV NO: 003 | REV DATE  | 14-01-2021 |
| DEPARTMENT: | ECE | LABORATORY: | DSP | SEMESTER: | 2ND |

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| **EXPERIMENT TITLE:** S**tudy the aliasing effect by using a sinusoidal signal. Show the plots of' continuous time signal, sampled signal and reconstructed signals by using subplot.** | EXPERIMENT NO: GEC-LM- EC-311LA -03 |
| ISSUE NO : 001 | ISSUE DATE  | 19-12-2013 | REV NO: 003 | REV DATE  | 14-01-2021 |
| DEPARTMENT: | ECE | LABORATORY: | DSP | SEMESTER: | 2ND |

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| **Aim:-** **Study the aliasing effect by using a sinusoidal signal. Show the plots of' continuous time signal, sampled signal and reconstructed signals by using subplot.****.****PROCEDURE:-** * Open MATLAB
* Open new M-file
* Type the program
* Save in current directory
* Compile and Run the program
* For the output see command window\ Figure window

**PROGRAM:-**Clc;close all;clear all;t=-10:0.01:10;T=8;fm=1/T;x=cos(2\*pi\*fm\*t);fs1=1.2\*fm;fs2=2\*fm;fs3=8\*fm;n1=-4:1:4;xn1=cos(2\*pi\*n1\*fm/fs1);subplot(221)plot(t,x);xlabel('time in seconds');ylabel('x(t)');title('continous time signal');subplot(222)stem(n1,xn1);hold on;plot(n1,xn1);xlabel('n');ylabel('x(n)');title('discrete time signal with fs<2fm');n2=-5:1:5;xn2=cos(2\*pi\*n2\*fm/fs2);subplot(223)stem(n2,xn2);hold on;plot(n2,xn2);xlabel('n');ylabel('x(n)');title('discrete time signal with fs=2fm');n3=-20:1:20;xn3=cos(2\*pi\*n3\*fm/fs3);subplot(224)stem(n3,xn3);hold on;plot(n3,xn3);xlabel('n');ylabel('x(n)');title('discrete time signal with fs>2fm');**RESULT:- Thus the program of Aliasing Effect is written and verified****OUTPUT** |

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| **EXPERIMENT TITLE: Write a program to compute and plot the convolution of two signals.** | EXPERIMENT NO: GEC-LM- EC-311LA -04 |
| ISSUE NO : 001 | ISSUE DATE  | 19-12-2013 | REV NO: 003 | REV DATE  | 14-01-2021 |
| DEPARTMENT: | ECE | LABORATORY: | DSP | SEMESTER: | 2ND |

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| **AIM: Write a program to compute and plot the convolution of two signals.****PROCEDURE:-** * Open MATLAB
* Open new M-file
* Type the program
* Save in current directory
* Compile and Run the program
* For the output see command window\ Figure window

**PROGRAM:-**clc;clear all;close all;x=input('enter 1st seq')h=input('enter 2nd seq')y=conv(x,h);subplot(3,1,1)stem(x)xlabel('n')ylabel('x')subplot(3,1,2)stem(h)xlabel('n')ylabel('x')subplot(3,1,3)stem(y)xlabel('n')ylabel('x')display('The result is'),y;**RESULT:-Thus the program of discrete convolution is written using MATLAB and verified.**enter 1st seq[1 2 3]x =1 2 3enter 2nd seq[1 2]h = 1 2The result is**OUTPUT:-** |

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| **EXPERIMENT TITLE: Define a function to compute the Z-transform of a finite length signal.** | EXPERIMENT NO: GEC-LM- EC-311LA -05 |
| ISSUE NO : 001 | ISSUE DATE  | 19-12-2013 | REV NO: 003 | REV DATE  | 14-01-2021 |
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| **AIM: Define a function to compute the Z-transform of a finite length signal.****PROCEDURE:-** * Open MATLAB
* Open new M-file
* Type the program
* Save in current directory
* Compile and Run the program
* For the output see command window\ Figure window

**PROGRAM:-**clc; close all; clear all;syms 'z';disp('If you input a finite duration sequence x(n), we will give you its z-transform');nf=input('Please input the initial value of n = ');nl=input('Please input the final value of n = ');x= input('Please input the sequence x(n)= ');syms 'm';syms 'y';f(y,m)=(y\*(z^(-m)));disp('Z-transform of the input sequence is displayed below');k=1;for n=nf:1:nl    answer(k)=(f((x(k)),n));   k=k+1;enddisp(sum(answer));**Example of Output**If you input a finite duration sequence x(n), we will give you its z-transformPlease input the initial value of n = 0Please input the final value of n = 4Please input the sequence x(n)= [1 0 3 -1 2]Z-transform of the input sequence is displayed below3/z^2 - 1/z^3 + 2/z^4 + 1 |

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| **EXPERIMENT TITLE: - Verify the properties of Discrete Fourier Transform (DFT).** | EXPERIMENT NO: GEC-LM- EC-311LA -06 |
| ISSUE NO : 001 | ISSUE DATE  | 19-12-2013 | REV NO: 003 | REV DATE  | 14-01-2021 |
| DEPARTMENT: | ECE | LABORATORY: | DSP | SEMESTER: | 2ND |

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| **AIM:- Verify the properties of Discrete Fourier Transform (DFT).****PROCEDURE:-** * Open MATLAB
* Open new M-file
* Type the program
* Save in current directory
* Compile and Run the program
* For the output see command window\ Figure window

**PROGRAM:-**%dft frequency shift propertyclose all;clear all;N=input('how many point dft do you want?');x1=input('enter the seq');n2=length(x1);c=zeros(N);x1=[x1 zeros(1,N-n2)];for k=1:N for n=1:N w=exp((-2\*pi\*i\*(k-1)\*(n-1))/N); x(n)=w; end c(k,:)=x;enddisp('dft is ');r=c\*x1';a1=input('enter the amount of shift in frequency domain');for n=1:N w=exp((2\*pi\*i\*(n-1)\*(a1))/N); x2(n)=w;endr1=x2.\*x1;subplot(221);stem(abs(r));grid on;title('orginal dft magnitude plot');subplot(222);stem(angle(r));grid on;title('orginal dft angle');for k=1:N for n=1:N w=exp((-2\*pi\*i\*(k-1)\*(n-1))/N); x(n)=w;  end c(k,:)=x;enddisp('dft is');r2=c\*r1';subplot(223);stem(abs(r2));grid on;title('shifted dft magnitude'); subplot(224); stem(angle(r2)); grid on; title('shifed dft angle');**RESULT:-Verified the properties of DTFT**how many point dft do you want? 6enter the seq[1 2 4 6 7 8 ]dft is enter the amount of shift in frequency domain 2dft is**OUTPUT:-** |

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| **EXPERIMENT TITLE: Design of FIR filters by using windowing method.** | EXPERIMENT NO: GEC-LM- EC-311LA -07 |
| ISSUE NO : 001 | ISSUE DATE  | 19-12-2013 | REV NO: 003 | REV DATE  | 14-01-2021 |
| DEPARTMENT: | ECE | LABORATORY: | DSP | SEMESTER: | 2ND |

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| **AIM:- Design of FIR filters by using windowing method.****PROCEDURE:-** * Open MATLAB
* Open new M-file
* Type the program
* Save in current directory
* Compile and Run the program
* For the output see command window\ Figure window

**PROGRAM:-**clc;close all;clear all;format long;rp=input('enter the passband ripple');rs=input('enter the stopband ripple');fp=input('enter the passband frequency');fs=input('enter the stopband frequency');f=input('enter the sampling frequency');beta=input('enter the beta value');wp=2\*(fp/f);ws=2\*(fs/f);num=-20\*log10(sqrt(rp\*rs))-13;dem=14.6\*(fs-fp)/f;n=ceil(num/dem); n1=n+1;if(rem(n,2)~=0) n1=n; n=n-1;end;y=kaiser(n1,beta);%Lowpass filterb=fir1(n,wp,y);[h,o]=freqz(b,1,256);m=20\*log10(abs(h));subplot(2,1,1);plot(o/pi,m);ylabel('gain in db---->');xlabel('Normalised frequency---->');title('FIR filter using Kaiser window of LPF ----');grid on;%Highpass filterb=fir1(n,wp,'high',y);[h,o]=freqz(b,1,256);m=20\*log10(abs(h));subplot(2,1,2);plot(o/pi,m);ylabel('gain in db---->');xlabel('Normalised frequency---->');title('FIR filter using Kaiser window of HPF ----');grid on;**RESULTS:-** Thus the MATLAB program for FIR LP\HP using Kaiser Window Techniques was executed.**INPUT:-**enter the pass band ripple 0.02enter the stop band ripple 0.01enter the pass band frequency 1000enter the stop band frequency 1500enter the sampling frequency 10000enter the beta value 5.8**OUTPUT:** |

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| **EXPERIMENT TITLE: Design of equiripple FIR filter.** | EXPERIMENT NO: GEC-LM- EC-311LA -08 |
| ISSUE NO : 001 | ISSUE DATE  | 19-12-2013 | REV NO: 003 | REV DATE  | 14-07-2016 |
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| **EXPERIMENT TITLE: Study of magnitude and phase response of Butterworth, Chebyshev and Elliptic filters.** | EXPERIMENT NO: GEC-LM- EC-311LA -09 |
| ISSUE NO : 001 | ISSUE DATE  | 19-12-2013 | REV NO: 003 | REV DATE  | 14-01-2021 |
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| **EXPERIMENT TITLE**: **Design of IIR filters by using different analog filter approximation method.** | EXPERIMENT NO: GEC-LM- EC-311LA -10 |
| ISSUE NO : 001 | ISSUE DATE  | 19-12-2013 | REV NO:003 | REV DATE  | 14-01-2021 |
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