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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 |
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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 |
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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 |
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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 3  enter 2nd seq[1 2]  h = 1 2  The 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;  end  disp(sum(answer));  **Example of Output**  If you input a finite duration sequence x(n), we will give you its z-transform  Please input the initial value of n = 0  Please input the final value of n = 4  Please input the sequence x(n)= [1 0 3 -1 2]  Z-transform of the input sequence is displayed below  3/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 |
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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 property  close 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;  end  disp('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;  end  r1=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;  end  disp('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? 6  enter the seq[1 2 4 6 7 8 ]  dft is  enter the amount of shift in frequency domain 2  dft 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 |
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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 filter  b=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 filter  b=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 0.02  enter the stop band ripple 0.01  enter the pass band frequency 1000  enter the stop band frequency 1500  enter the sampling frequency 10000  enter 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 | |
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