

Scilab Manual for  
Signals and Systems  
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# Contents

List of Scilab Solutions	4
1 Develop a program to generate Following Continuous Signal a) Sinusoidal; b)Cosine; c)Triangle; d)Square Wave.	6
2 Develop a program to generate Following Discrete Signal a) Impulse; b)Step; c)Ramp; d)Exponential.	9
3 Develop a program for addition of two continuous signals using Scilab.	14
4 Develop a program for addition of two discrete signals using Scilab.	17
5 Develop a program for Aliasing Process using Scilab.	20
6 Develop a program for Linear Convolution of two sequences using Scilab.	24
7 Develop a program for Circular Convolution of two sequences using Scilab.	27
8 Develop a program to perform cross correlation operation using Scilab.	30
9 Develop a program to perform Auto correlation operation using Scilab.	33

10	Develop a program to obtain Z transform of basic function using Scilab.	36
11	Develop a program to obtain pole zero plot of given transfer function using Scilab.	39
12	Develop a program to understand the concept of amplitude modulation.	42
13	Develop a program to understand the concept of frequency modulation.	45

# List of Experiments

Solution 1.01	Continuous Signal . . . . .	6
Solution 2.01	Discrete wave with positive exponential . . . . .	9
Solution 2.02	Discrete waves with negative exponential . . . . .	11
Solution 3.01	Addition of Continuous signal . . . . .	14
Solution 4.01	Addition of Discrete signal . . . . .	17
Solution 5.01	Aliasing Effect . . . . .	20
Solution 6.01	Linear Convolution . . . . .	24
Solution 7.01	Circular Convolution . . . . .	27
Solution 8.01	Cross correlation . . . . .	30
Solution 9.01	Auto correlation . . . . .	33
Solution 10.01	Z transform . . . . .	36
Solution 11.01	Pole Zero form Transfer function . . . . .	39
Solution 12.01	Amplitude Modulation . . . . .	42
Solution 13.01	Frequency Modulation . . . . .	45

# List of Figures

1.1	Continuous Signal	8
2.1	Discrete wave with positive exponential	11
2.2	Discrete waves with negative exponential	13
3.1	Addition of Continuous signal	15
4.1	Addition of Discrete signal	18
5.1	Aliasing Effect	21
6.1	Linear Convolution	25
7.1	Circular Convolution	28
8.1	Cross correlation	31
9.1	Auto correlation	34
10.1	Z transform	38
11.1	Pole Zero form Transfer function	40
11.2	Pole Zero form Transfer function	41
12.1	Amplitude Modulation	43
13.1	Frequency Modulation	46

## Experiment: 1

Develop a program to generate Following Continuous Signal a) Sinusoidal; b) Cosine; c) Triangle; d) Square Wave.

Scilab code Solution 1.01 Continuous Signal

```
1 //Experiment-1
2 // windows - 7 - 64-Bit
3 //Scilab - 6.0.1
4
5
6 //AIM: Develop a program to generate Following
   Continuous Signal a) Sinusoidal; b) Cosine; c)
   Triangle; d) Square Wave.
7
8 clear all
9 clc
10 V = input('Enter the value of Voltage in volts : ')
      // Example v= 20 Volt
11 f = input('Enter the value of frequency in Hertz : ')
      // Example f=50 Hz
```

```

12 t=0:1/(1000*f):5/f;
13 // Generation of Sine Wave.
14 y1=V*(sin(2*%pi*f*t));
15 xgrid;
16 subplot(221)
17 plot(t,y1)
18 xlabel('Time (sec) ')
19 ylabel('y = v*sinwt')
20 title('Sine wave','fontsize',4)
21 // Generation of Cos Wave.
22 y2=V*(cos(2*%pi*f*t));
23 subplot(222)
24 plot(t,y2)
25 xgrid;
26 xlabel('Time (sec) ')
27 ylabel('y = v*coswt')
28 title('Cosine wave','fontsize',4)
29 // Generation of Triangle Wave.
30 t1 =0:( %pi /4) :(4* %pi ) ;
31 y3 = V *sin (2* t1) ;
32 a = gca () ;
33 subplot(223)
34 plot (t1 ,y3 ) ;
35 xgrid;
36 xlabel('Time (sec) ')
37 ylabel('Amplitude')
38 title('Triangle wave','fontsize',4)
39 // Generation of Square Wave.
40 t3=0:1/(1000*f):0.6;
41 y4=(V-1)*squarewave(2*%pi*10*t3);
42 subplot(224)
43 plot(t3,y4)
44 xgrid;
45 xlabel('Time (sec) ')
46 ylabel('Amplitude')
47 title('Square wave','fontsize',4)
48
49 //... Consol Window entry...

```

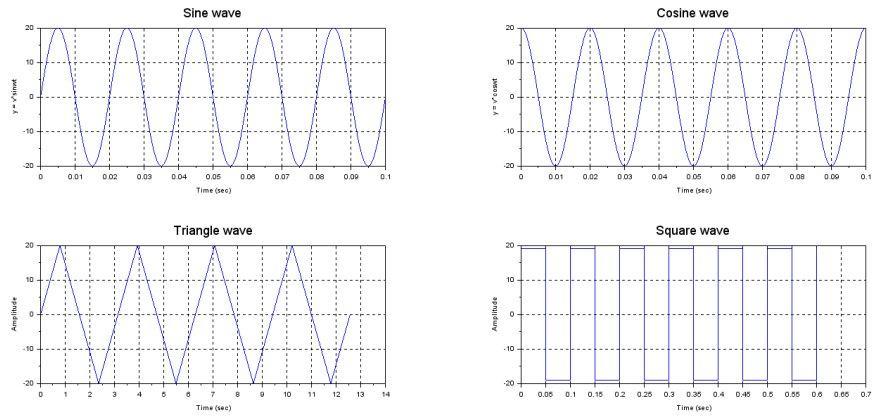


Figure 1.1: Continuous Signal

```

50 //Enter the value of Voltage in volts : 20
51 //Enter the value of frequency in Hertz : 50

```

---

## Experiment: 2

Develop a program to generate  
Following Discrete Signal a)  
Impulse; b)Step; c)Ramp;  
d)Exponential.

Scilab code Solution 2.01 Discrete wave with positive exponential

```
1 //Experiment-2
2 // windows - 7 - 64-Bit
3 //Scilab - 6.0.1
4
5
6 //AIM:  Devlop a program to generate Following
   Discrete Signal a) Impulse; b)Step; c)Ramp; d)
   Exponential.
7
8 clc ;
9 clf ;
10 clear all;
11 L =input("Enter the Length of signal="); // L=10 (
   must be greater than 2)
12 b =input("Enter the value of Exponential co-
```

```

    efficient=""); // b = 0.5
13 // positive value for incremental Exponential signal
14
15 n=-L:L;
16 //Generation of Unit Impulse Signal
17 x1=[zeros(1,L),ones(1,1),zeros(1,L)];
18 a= gca ();
19 a. y_location = "middle"
20 subplot(221)
21 plot2d3 (n,x1);
22 title ( 'Unit Impulse Signal', "fontsize", 3 );
23 xlabel ( ' Number of Sample————>' );
24 ylabel ( 'Amplitude ——>' );
25 //Generation of Unit Step Signal
26 x2=[zeros(1,L),ones(1,L +1)];
27 a= gca ();
28 a. y_location = "middle";
29 subplot(222)
30 plot2d3 (n,x2);
31 title ( 'Unit Step', "fontsize", 3 );
32 xlabel ( ' Number of Sample————>' );
33 ylabel ( 'Amplitude ——>' );
34 //Generation of Ramp Signal
35 x3=[zeros(1,L),0:L];
36 a = gca ();
37 a. y_location = 'middle' ;
38 subplot(223)
39 plot2d3 (n,x3);
40 title ( 'Ramp of signal', "fontsize", 3);
41 xlabel ( ' Number of Sample————>' );
42 ylabel ( 'Amplitude ——>' );
43
44 //Generation of Exponential Signal
45 t = -2:0.1:2;
46 x4= exp (b*t);
47 subplot(224)
48 plot2d3 (x4);
49 title ( 'Exponential Signal', "fontsize", 3 );

```

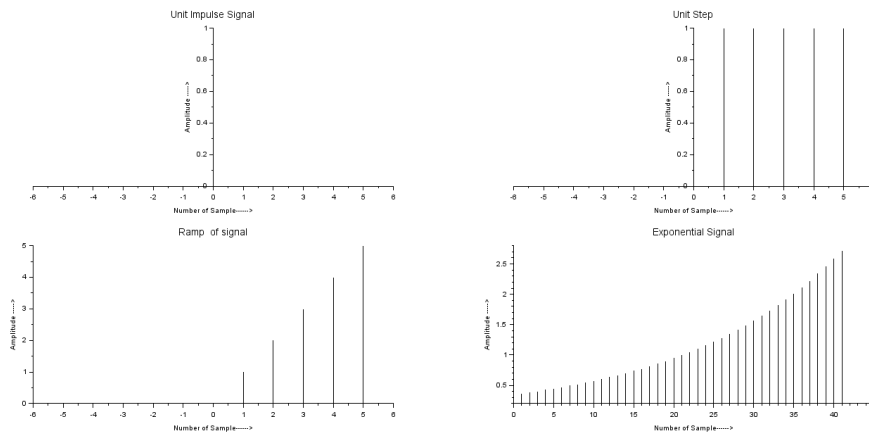


Figure 2.1: Discrete wave with positive exponential

```

50 xlabel ( ' Number of Sample————>' );
51 ylabel ( ' Amplitude —————>' );
52
53 // ... Console input
54 //Enter the Length of signal=5
55
56 //Enter the value of Exponential co-efficient=0.5

```

---

### Scilab code Solution 2.02 Discrete waves with negative exponential

```

1 //Experiment-2
2 // windows - 7 - 64-Bit
3 //Scilab - 6.0.1
4
5
6 //AIM: Develop a program to generate Following
   Discrete Signal a) Impulse; b) Step; c) Ramp; d)
   Exponential.
7

```

```

8  clc ;
9  clf ;
10 clear all;
11 L =input("Enter the Length of signal="); // L=10 (
    must be greater than 2)
12 b =input("Enter the value of Exponential co-
    efficient="); // b = 0.5
13 n=-L:L;
14 //Generation of Unit Impulse Signal
15 x1=[zeros(1,L),ones(1,1),zeros(1,L)];
16 a= gca ();
17 a. y_location = "middle"
18 subplot(221)
19 plot2d3 (n,x1);
20 title ( 'Unit Impulse Signal', "fontsize",3 );
21 xlabel ( ' Number of Sample————>' );
22 ylabel ( 'Amplitude ——>' );
23 //Generation of Unit Step Signal
24 x2=[zeros(1,L),ones(1,L +1)];
25 a= gca ();
26 a. y_location = "middle";
27 subplot(222)
28 plot2d3 (n,x2);
29 title ( 'Unit Step', "fontsize",3 );
30 xlabel ( ' Number of Sample————>' );
31 ylabel ( 'Amplitude ——>' );
32 //Generation of Ramp Signal
33 x3=[zeros(1,L),0:L];
34 a = gca ();
35 a. y_location = 'middle' ;
36 subplot(223)
37 plot2d3 (n,x3);
38 title ( 'Ramp of signal', "fontsize",3);
39 xlabel ( ' Number of Sample————>' );
40 ylabel ( 'Amplitude ——>' );
41
42 //Generation of Negative value Exponential Signal
43 t = -2:0.1:2;

```

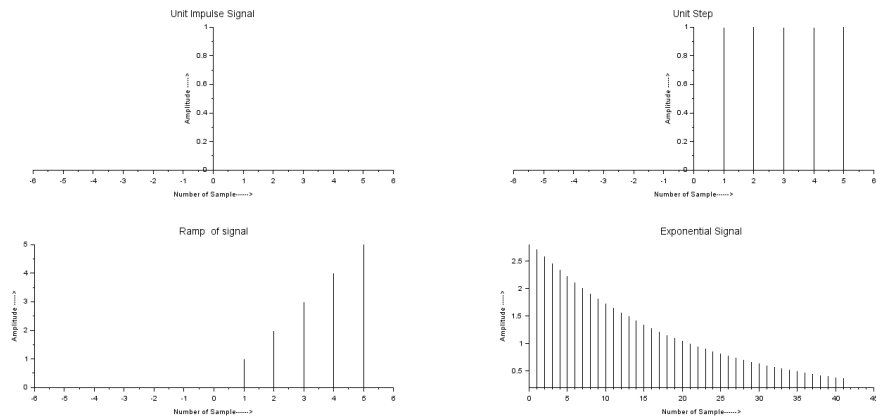


Figure 2.2: Discrete waves with negative exponential

```

44 x4= exp (-b*t);
45 subplot(224)
46 plot2d3 (x4);
47 title ( 'Exponential Signal ', "fontsize", 3 );
48 xlabel ( ' Number of Sample————>' );
49 ylabel ( ' Amplitude ——>' );
50
51 // ... Console input
52 //Enter the Length of signal=5
53
54 //Enter the value of Exponential co-efficient=0.5

```

---

## Experiment: 3

Develop a program for addition of two continuous signals using Scilab.

Scilab code Solution 3.01 Addition of Continuous signal

```
1 //Experiment-3
2 // windows - 7 - 64-Bit
3 //Scilab - 6.0.1
4
5
6 //AIM: Develop a program for addition of two
   Continuous signals using Scilab.
7
8
9 // Addition of Continuous Signals
10 clc ;
11 clear all;
12 V = input('Enter the value of Voltage in volts : ')
   // Example v= 5 Volt
13 f = input('Enter the value of Signal 1 frequency in
```

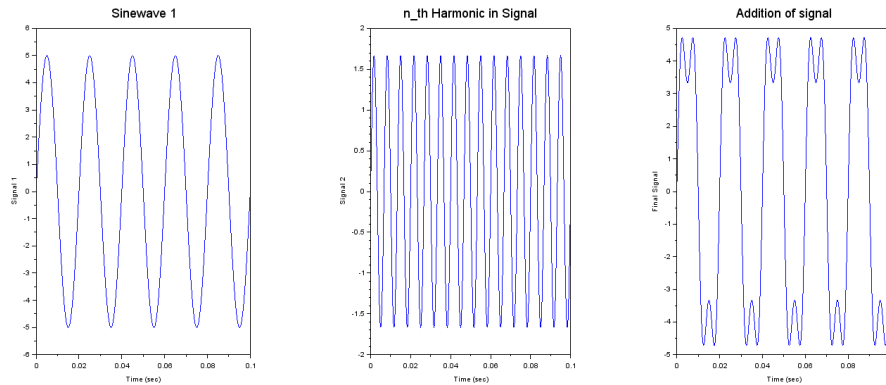


Figure 3.1: Addition of Continuous signal

```

Hertz : ') // Example f1=50 Hz
14 n = input('Enter the number of harmonic in signal :
           ') // Example n= 3
15 t=0:1/(1000*f):5/f;
16 y1=V*(sin(2*pi*f*t));
17 y2=(V/n)*(sin(2*pi*(n*f)*t));
18 y3=y1+y2;
19 subplot (1 ,3 ,1);
20 plot (t,y1);
21 xlabel('Time (sec) ');
22 ylabel('Signal 1')
23 title('Sinewave 1','fontsize',4)
24 subplot (1 ,3 ,2);
25 plot (t,y2);
26 xlabel('Time (sec) ');
27 ylabel('Signal 2')
28 title('n_th Harmonic in Signal','fontsize',4)
29 subplot (1 ,3 ,3);
30 plot (t,y3);
31 title('Addition of signal','fontsize',4)
32 xlabel('Time (sec) ');
33 ylabel('Final Signal')
34

```

```
35 // ..... Execution Consol Value
    .....//
36 //Enter the value of Voltage in volts : 5
37 //Enter the value of Signal 1 frequency in Hertz :
    50
38 //Enter the number of harmonic in signal : 3
```

---

## Experiment: 4

Develop a program for addition of two discrete signals using Scilab.

Scilab code Solution 4.01 Addition of Discrete signal

```
1 //Experiment-3
2 // windows - 7 - 64-Bit
3 //Scilab - 6.0.1
4
5
6 //AIM: Develop a program for addition of two
   discrete signals using Scilab.
7
8
9 // Addition of Discontinuous Signals
10
11 clc ;
12 clear all;
13
14 L =input("Enter the Length of signal="); // L=10 (
```

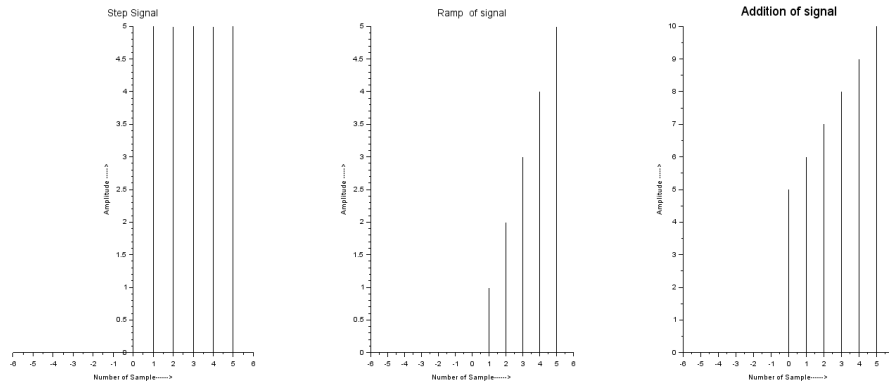


Figure 4.1: Addition of Discrete signal

```

    must be greater than 2)
15 n=-L:L;
16 //Generation of Step Signal
17 x1=5*[zeros(1,L),ones(1,L +1)];
18 a= gca ();
19 a. y_location = "middle";
20 subplot(131)
21 plot2d3 (n,x1);
22 title ( 'Step Signal', "fontsize",3 );
23 xlabel ( ' Number of Sample————>' );
24 ylabel ( 'Amplitude ——>' );
25 //Generation of Ramp Signal
26 x2=[zeros(1,L),0:L];
27 a = gca ();
28 a. y_location = 'middle' ;
29 subplot(132)
30 plot2d3 (n,x2);
31 title ( 'Ramp of signal', "fontsize",3);
32 xlabel ( ' Number of Sample————>' );
33 ylabel ( 'Amplitude ——>' );
34 x3=x1+x2; // Addition of two signals
35 subplot(133)
36 plot2d3 (n,x3);

```

```
37 title('Addition of signal ','fontsize',4)
38 xlabel(' Number of Sample————>')
39 ylabel('Amplitude ———>')
40
41 // ..... Execution Consol Value
   .....//
42 // Enter the Length of signal=5
```

---

## Experiment: 5

# Develop a program for Aliasing Process using Scilab.

Scilab code Solution 5.01 Aliasing Effect

```
1 //Experiment-5
2 // windows - 7 - 64-Bit
3 //Scilab - 6.0.1
4
5
6 //AIM: Develop a program for ALIASING Process using
   scilab
7
8 clc ;
9
10 clear all;
11
12 f=input("Enter the frequency of continuous signal=")
   ;// f= 1000
13 v=input("Enter the Amplitude of continuous signal=")
   ; // v = 10
14 fs=input (" Enter the sampling Frequency Fs =") ; //
```

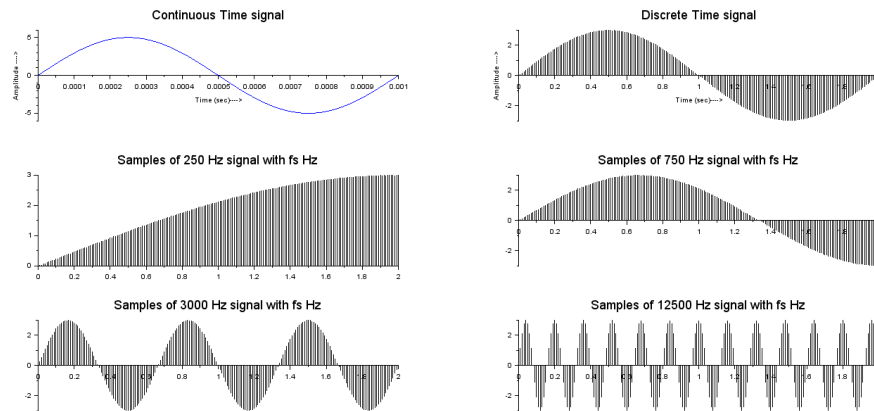


Figure 5.1: Aliasing Effect

```

fs= 2000Hz
15 t=0:0.00001:1/f;
16 x1=v*sin(2*%pi*f*t);
17 subplot(3,2,1)
18 a=gca();
19 a.x_location="origin";
20 a.y_location="origin";
21 plot(t,x1)
22 xlabel('Time (sec)——>')
23 ylabel('Amplitude ——>')
24 title('Continuous Time signal','fontsize',4)
25 f2=f/fs;
26 n=0:0.01:1/f2;
27 y1=3*sin(2*%pi*f2*n);
28 subplot(3,2,2)
29 a = gca ();
30 a.x_location="origin";
31 a.y_location="origin";
32 plot2d3("gnn",n,y1)
33 xlabel('Time (sec)——>')
34 ylabel('Amplitude ——>')
35 title('Discrete Time signal','fontsize',4)
36 x2 = 250;

```

```

37 y2=3*sin(2*pi*(x2/fs)*n) ;
38 subplot (3,2,3)
39 a = gca () ;
40 a. x_location ="origin";
41 a. y_location = "origin";
42 plot2d3 ("gnn",n,y2)
43 title ('Samples of 250 Hz signal with fs Hz',"
        fontsize",4)
44 x3 = 750;
45 y3 = 3*sin(2*pi*(x3/fs)*n) ;
46 subplot (3,2,4)
47 a = gca () ;
48 a. x_location ="origin";
49 a. y_location = "origin";
50 plot2d3 ("gnn",n,y3)
51 title ('Samples of 750 Hz signal with fs Hz',"
        fontsize",4)
52 x4 = 3000;
53 y4 = 3*sin(2*pi*(x4/fs)*n) ;
54 subplot (3,2,5)
55 a = gca () ;
56 a. x_location ="origin";
57 a. y_location = "origin";
58 plot2d3 ("gnn",n,y4)
59 title ('Samples of 3000 Hz signal with fs Hz',"
        fontsize",4)
60 x5 = 12500;
61 y5 = 3*sin(2*pi*(x5/fs)*n) ;
62 subplot (3,2,6)
63 a = gca () ;
64 a. x_location ="origin";
65 a. y_location = "origin";
66 plot2d3 ("gnn",n,y5)
67 title ('Samples of 12500 Hz signal with fs Hz',"
        fontsize",4)
68 //Example
69 // E n t e r t h e f r e q u e n c y o f C o n t i n
    u o u s T i m e S i g n a l :=1000

```

70 // E n t e r t h e Sampling f r e q u e n c y Fs=  
2000

---

## Experiment: 6

Develop a program for Linear Convolution of two sequences using Scilab.

Scilab code Solution 6.01 Linear Convolution

```
1 //Experiment-6
2 // windows - 7 - 64-Bit
3 //Scilab - 6.0.1
4
5
6 //AIM:  Develop a program for Linear Convolution of
       two sequences using scilab
7 clc ;
8 clear ;
9 x = input ("ENTER THE FIRST SEQUENCE [use square
           breackt- arrey form]= "); // x ( n ) =[1 2 3 4 ]
10 h = input ("ENTER THE SECOND SEQUENCE ="); //h ( n )
           =[1 2 3 ]
11 l=length (x)+length (h)-1;
12 y = convol(x,h)
```

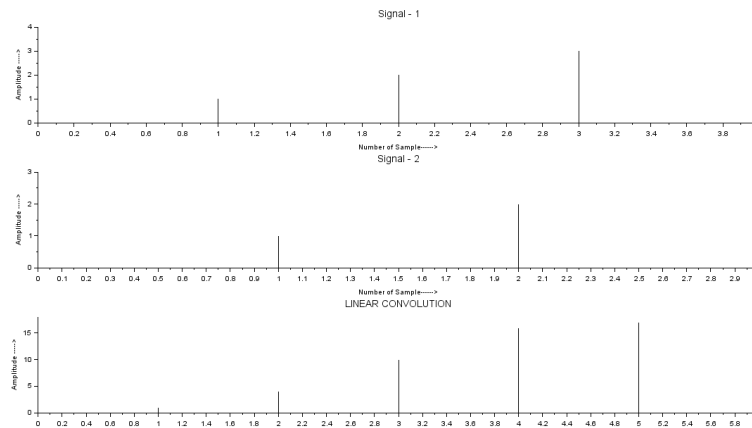


Figure 6.1: Linear Convolution

```

13 disp(y, 'Linear convolution is =')
14 subplot (311)
15 plot2d3('gmn',x);
16 a = gca ();
17 a.x_location = "origin";
18 a.y_location = "origin";
19 title ( 'Signal - 1',"fontsize",3 );
20 xlabel ( ' Number of Sample————>' );
21 ylabel ( ' Amplitude ——>' );
22 subplot (312)
23 plot2d3(h);
24 a = gca ();
25 a.x_location = "origin";
26 a.y_location = "origin";
27 title ( 'Signal - 2',"fontsize",3 );
28 xlabel ( ' Number of Sample————>' );
29 ylabel ( ' Amplitude ——>' );
30 subplot (313)
31 plot2d3(y);
32 a = gca ();
33 a.x_location = "origin";
34 a.y_location = "origin";
35 title ( 'LINEAR CONVOLUTION',"fontsize",3 );

```

```

36 xlabel ( ' Number of Sample————>' );
37 ylabel ( 'Amplitude ——>' );
38
39 //.....Execution in scilab console....
40
41 //ENTER THE FIRST SEQUENCE [use square breackt-
    array form]= [1 2 3 4]
42 //ENTER THE SECOND SEQUENCE =[1 2 3]
43 //—————Answer of linear convolution—————
44 //Linear convolution is =
45
46 //      1.      4.      10.      16.      17.      12.

```

---

## Experiment: 7

Develop a program for Circular Convolution of two sequences using Scilab.

Scilab code Solution 7.01 Circular Convolution

```
1 //Experiment-7
2 // windows - 7 - 64-Bit
3 //Scilab - 6.0.1
4
5
6 //AIM:  Develop a program for circular Convolution of
       two sequences using scilab
7 clc ;
8 clf();
9 clear ;
10 x = input ("ENTER THE FIRST SEQUENCE [use square
       bracket- array form]= "); // x ( n ) =[1 2 3 5 6
       4]
11 h = input ("ENTER THE SECOND SEQUENCE ="); //h ( n )
       =[1 2 3 1]
```

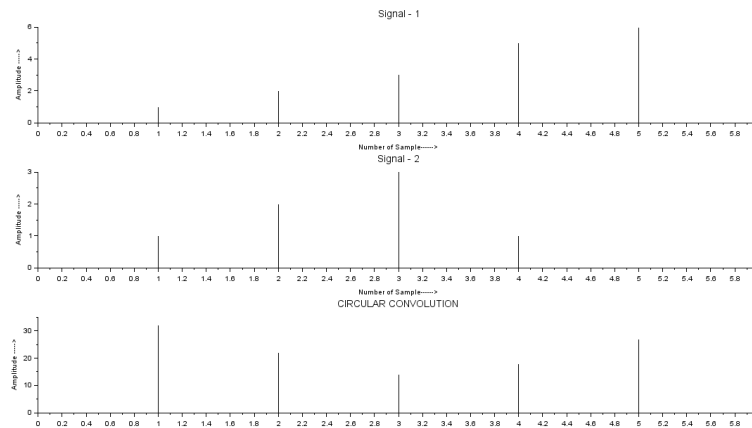


Figure 7.1: Circular Convolution

```

12 N1= length(x);
13 N2= length(h);
14 N= max (N1 ,N2);
15 N3=N1-N2;
16 if(N3>=0) then
17     h=[h,zeros(1,N3)];
18 else
19     x=[x,zeros(1,-N3)];
20 end
21 for n =1: N
22     y(n)=0;
23 for i =1:N
24     j=n-i+1;
25     if(j<=0)
26         j=N+j;
27     end
28     y(n)=y(n)+x(i)*h(j)
29 end
30 end
31 disp(y,'Circular convolution is =')
32 subplot (311)
33 plot2d3('gmn',x);
34 a = gca ();

```

```

35 a.x_location = "origin";
36 a.y_location = "origin";
37 title ( 'Signal - 1',"fontsize",3 );
38 xlabel ( ' Number of Sample————>' );
39 ylabel ( 'Amplitude ——>' );
40 subplot (312)
41 plot2d3('gnn',h);
42 a = gca ();
43 a.x_location = "origin";
44 a.y_location = "origin";
45 title ( 'Signal - 2',"fontsize",3 );
46 xlabel ( ' Number of Sample————>' );
47 ylabel ( 'Amplitude ——>' );
48 subplot (313)
49 plot2d3('gnn',y);
50 a = gca ();
51 a.x_location = "origin";
52 a.y_location = "origin";
53 title ( 'CIRCULAR CONVOLUTION',"fontsize",3 );
54 xlabel ( ' Number of Sample————>' );
55 ylabel ( 'Amplitude ——>' );
56
57
58 //.... Execution in Scilab 5.4.1 console....
59
60 //ENTER THE FIRST SEQUENCE [use square brack-
    array form]= [1 2 3 5 6 4]
61 //ENTER THE SECOND SEQUENCE =[1 2 3 1]
62
63 // Circular convolution is =
64
65 // 32 22 14 18 27 34

```

---

## Experiment: 8

Develop a program to perform cross correlation operation using Scilab.

Scilab code Solution 8.01 Cross correlation

```
1 //Experiment-8
2 // windows - 7 - 64-Bit
3 //Scilab - 6.0.1
4
5
6 //AIM:  Develop a program for Performing cross
      correlation operation using SCILAB code
7
8
9 clear ;
10 clc;
11 x1 =input ("ENTER THE FIRST SEQUENCE 01 [use square
      bracket- array form]= ");//[1 2 1 1]
12 x2 =input ("ENTER THE FIRST SEQUENCE 02 [use square
      bracket- array form]= "); //[1 1 2 1]
```

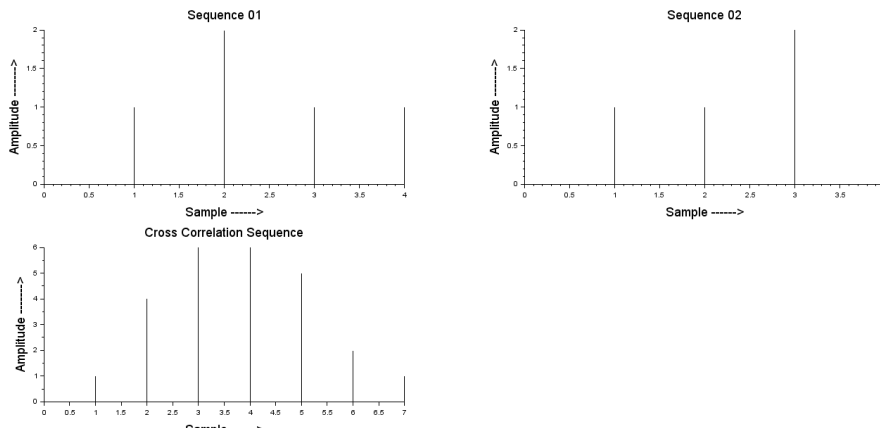


Figure 8.1: Cross correlation

```

13 n1= input ("ENTER THE Arrey length of sequence 2
            from starting point [use square bracket- array
            form]= "); //[1 2 3 4]
14 n2= input ("ENTER THE Arrey length of sequence 2
            from starting point [use square bracket- array
            form]= "); //[1 2 3 4]
15 subplot (2 ,2 ,1)
16 plot2d3 ('gnn ',n1,x1);
17 a = gca ();
18 a.x_location = "origin";
19 a.y_location = "origin";
20 xlabel ("Sample ----->" ," fontsize" ,4);
21 ylabel ("Amplitude ----->" ," fontsize" ,4);
22 title ("Sequence 01" ," fontsize" ,4);
23 subplot (2 ,2 ,2)
24 plot2d3 ('gnn ',n2,x2);
25 a = gca ();
26 a.x_location = "origin";
27 a.y_location = "origin";
28 xlabel ("Sample ----->" ," fontsize" ,4);
29 ylabel ("Amplitude ----->" ," fontsize" ,4);
30 title ("Sequence 02" ," fontsize" ,4);
31 [c, ind ]= xcorr (x1 ,x2) // function of cross

```

```

    correlation
32 [ind',c']
33 disp(c,'Cross Correlation Sequence is =')
34 subplot (2 ,2 ,3)
35 plot2d3 ('gmn',c)
36 a = gca ();
37 a.x_location = "origin";
38 a.y_location = "origin";
39 xlabel ("Sample ——>" ,"fontsize" ,4);
40 ylabel ("Amplitude ——>" ,"fontsize" ,4);
41 title ("Cross Correlation Sequence" ,"fontsize" ,4);
42
43 // ..... Execution in Consol .....
44
45 //ENTER THE FIRST SEQUENCE 01 [use square breackt-
    array form]=[1 2 1 1]
46 //ENTER THE FIRST SEQUENCE 02 [use square breackt-
    array form]=[1 1 2 1]
47 //ENTER THE Arrey length of sequence 2 from starting
    point [use square breackt- array form]=[1 2 3
    4]
48 //ENTER THE Arrey length of sequence 2 from starting
    point [use square breackt- array form]=[1 2 3
    4]
49
50 // Cross Correlation Sequence is =
51
52 //      1.      4.      6.      6.      5.      2.      1.

```

---

## Experiment: 9

Develop a program to perform  
Auto correlation operation  
using Scilab.

Scilab code Solution 9.01 Auto correlation

```
1 //Experiment-9
2 // windows - 7 - 64-Bit
3 //Scilab - 6.0.1
4
5
6 //AIM:  Develop a program for Performing Auto
      correlation operation using SCILAB code
7
8
9 clear ;
10 clc;
11 x1 =input ("ENTER THE FIRST SEQUENCE 01 [use square
      bracket- array form]= ");//[2 -1 2 3 1]
12 n = length (x1);
13 s1= input ("ENTER THE starting point of array = ");
```

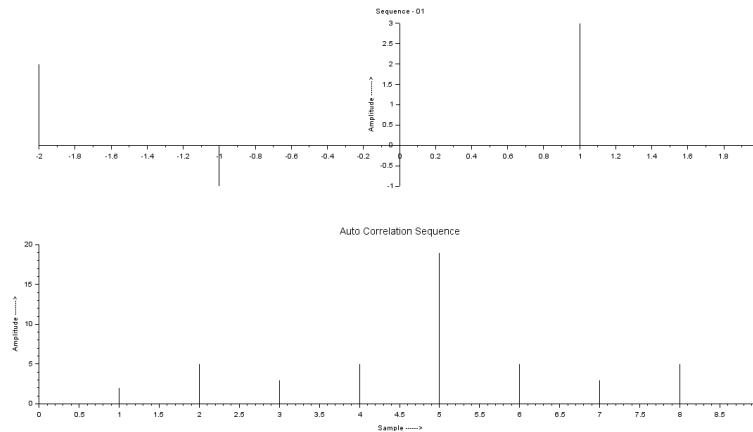


Figure 9.1: Auto correlation

```

// -2
14 e1=s1+n-1;
15 n1=s1:1:e1;
16 subplot (2 ,1 ,1)
17 plot2d3 ('gmn',n1,x1);
18 ylabel ("Amplitude ----->");
19 title ("Sequence - 01 ");
20 a = gca ();
21 a.x_location = "origin";
22 a.y_location = "origin";
23 x2 = x1($:-1:1);
24 n1 = s1+s1;
25 nh = n1+n1+n1-2;
26 c= convol(x1 ,x2) // function for Auto correlation
27 disp(c,'Cross Correlation Sequence is =')
28 subplot (2 ,1 ,2)
29 plot2d3 ('gmn',c)
30 a = gca ();
31 a.x_location = "origin";
32 a.y_location = "origin";
33 xlabel ("Sample ----->");
34 ylabel ("Amplitude ----->");
35 title ("Auto Correlation Sequence" ,"fontsize" ,3);

```

```
36
37 //..... Execution in Consol .....
38
39 //ENTER THE FIRST SEQUENCE 01 [use square bracket-
    array form]= [2 -1 2 3 1]
40
41 //ENTER THE starting point of array = -2
42
43 // Cross Correlation Sequence is =
44
45 //  2.   5.   3.   5.   19.   5.   3.   5.   2.
```

---

## Experiment: 10

Develop a program to obtain Z transform of basic function using Scilab.

Scilab code Solution 10.01 Z transform

```
1 //Experiment-10
2 // windows - 7 - 64-Bit
3 //Scilab - 6.0.1
4
5
6 //AIM:  Develop a program To obtain Z transform using
      SCILAB code
7
8
9 clear ;
10 clc ;
11 x= input ("Negative sequence coefficient =")//[1 2 3
      2 7]
12 T= input("sampling time =") // 1
13 Xz= poly([x],"Z","coeff")
14 disp (Xz, 'X(Z) = ' )
15 //For Positive sequence
```

```

16 z= poly (0, 'z')
17 disp ("positive sequence of Z transform =")
18 Xzp = horner (Xz ,1/z)
19 disp (Xzp, 'X(z)' )
20
21 // Discreat form
22 disp("Transfer Function in State-space
      representation = ")
23 s= poly(0, 's');
24 z= poly(0, 'z');
25 tf= syslin('c',(s+1)/(s^2-5*s+2));
26 disp (tf)
27 disp ("Transfer Function in Discrete form = ")
28 df = horner(tf,(2/T)*(z -1)/(z+1))
29 disp (df)
30
31
32 // .... Execution Console ....
33
34 //Negative equence coefficient =[1,2,3,2,7]
35 //sampling time =1
36
37 // X(Z) =
38
39 //           2      3      4
40 //   1 + 2Z + 3Z + 2Z + 7Z
41
42 // positive sequence coefficient =
43
44 //X(z)
45
46 //           2      3      4
47 //   7 + 2z + 3z + 2z + z
48 //   -----
49 //           4
50 //           z
51
52 //Transfer Function in State-space representation

```

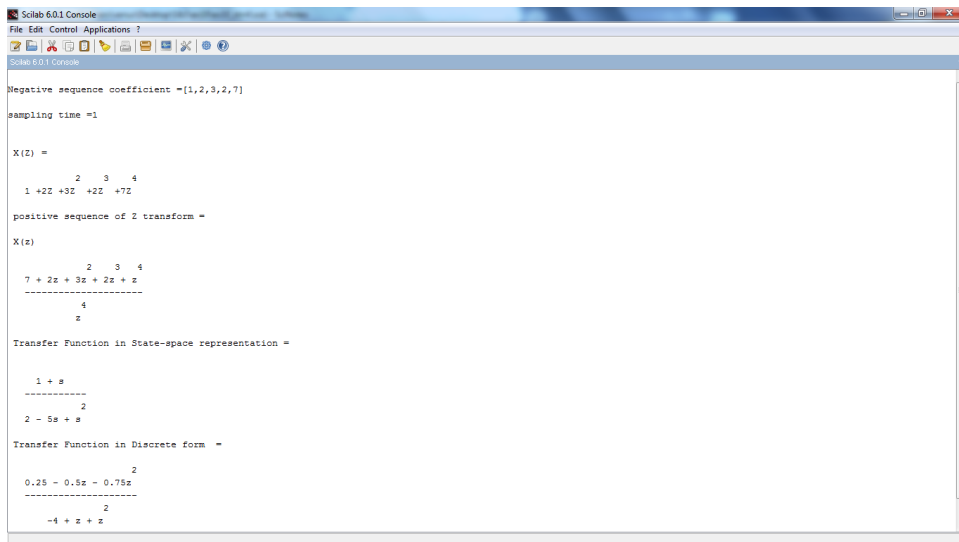


Figure 10.1: Z transform

```

53 // =
54
55 // 1 + s
56 // -----
57 //                               2
58 // 2 - 5s + s
59
60 // Transfer Function in Discrete form =
61
62 //                               2
63 // 0.25 - 0.5z - 0.75z
64 // -----
65 //                               2
66 // - 4 + z + z

```

---

## Experiment: 11

Develop a program to obtain pole zero plot of given transfer function using Scilab.

Scilab code Solution 11.01 Pole Zero form Transfer function

```
1 //Experiment-11
2 // windows - 7 - 64-Bit
3 //Scilab - 5.4.1
4
5
6 //AIM: Develop a program to Plot pole zero fro
   transfer function using SCILAB code
7
8
9 clear ;
10 clc ;
11 z=poly(0, 'z');
12 num=input('Enter Numerator equation =')//[1];
13 den=input('Enter Denominator equation =')//[1-1.5*z
   ^-1+0.5*z^-2];
14 tf=num./den
15 disp(tf,"Transfer Function with positive power = ")
```

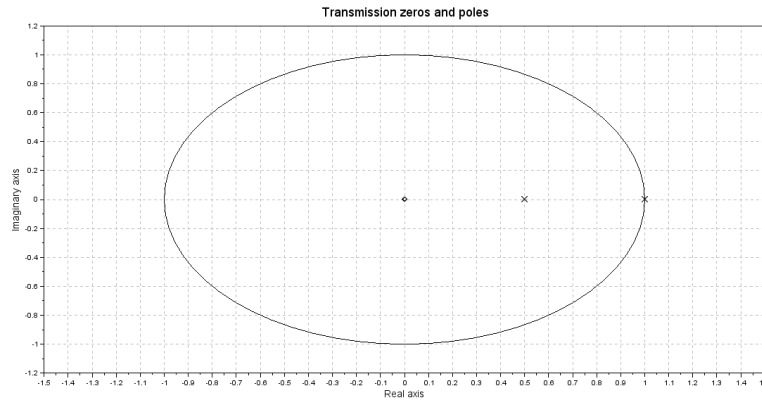


Figure 11.1: Pole Zero form Transfer function

```

16 H=syslin('c',tf);
17 plzr(H)
18 scf;
19 bode(H)
20
21 //——— COnsole window———
22 //Enter Numerator equation =[1]
23 //Enter Denominator equation =[1-1.5*z^-1+0.5*z^-2]
24
25 //Transfer Function with positive power =
26
27 //          2
28 //          z
29 //  —————
30 //                                2
31 //  0.5 - 1.5z + z

```

---

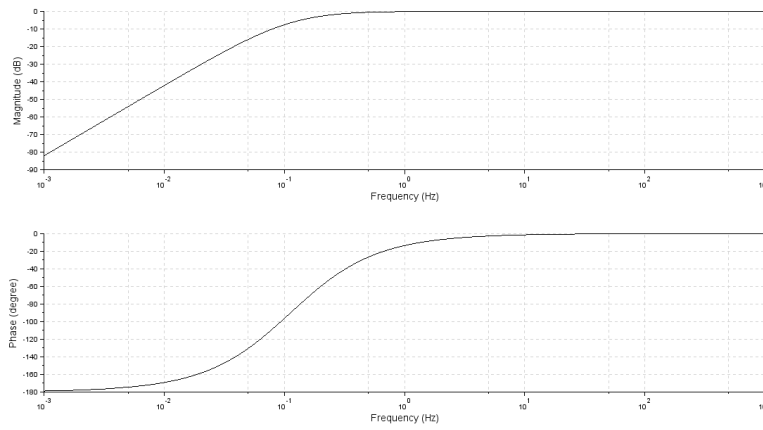


Figure 11.2: Pole Zero form Transfer function

## Experiment: 12

Develop a program to understand the concept of amplitude modulation.

Scilab code Solution 12.01 Amplitude Modulation

```
1 //Experiment -12
2 // windows - 7 - 64-Bit
3 //Scilab - 6.0.1
4
5
6 //AIM:  Develop a program for Performing Amplitude
      modulation using SCILAB code
7
8
9 clear ;
10 clc;
11 f= input ("Enter the value of signal frequency=");
      // f=5
12 fc=input (" Enter the value of carrier frequency=");
      //(fc>f) fc = 100
```

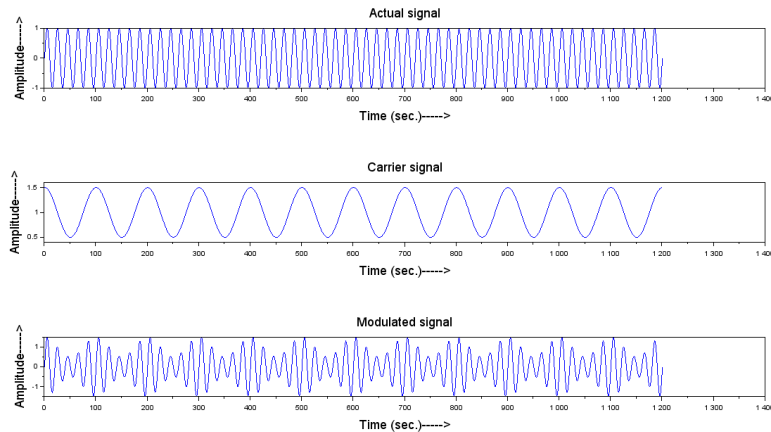


Figure 12.1: Amplitude Modulation

```

13 n=0:1200;
14 t=n/fc;
15 m=input("Enter the value of modulation index ="); //
    m = 1
16 s1=sin(2*%pi*f*t);
17 subplot(311);
18 plot(s1);
19 xlabel("Time (sec.)——>" ," fontsize",4);
20 ylabel("Amplitude——>" ," fontsize",4);
21 title("Actual signal" ," fontsize",4);
22 //Generation of carrier signal
23 s2=1+0.5*cos(2*%pi*m*t);
24 subplot (312);
25 plot (s2);
26 xlabel("Time (sec.)——>" ," fontsize",4);
27 ylabel("Amplitude——>" ," fontsize",4);
28 title("Carrier signal" ," fontsize",4);
29 ms=s2.*s1; // Modulating Signal
30 subplot (313);
31 plot(ms);
32 xlabel("Time (sec.)——>" ," fontsize",4);
33 ylabel("Amplitude——>" ," fontsize",4);

```

```
34 title("Modulated signal" ,"fontsize",4);
35
36 //—— consol value——
37 //Enter the value of signal frequency=5
38
39 //Enter the value of carrier frequency=100
40
41 //Enter the value of modulation index =1
```

---

## Experiment: 13

Develop a program to understand the concept of frequency modulation.

Scilab code Solution 13.01 Frequency Modulation

```
1 //Experiment-13
2 // windows - 7 - 64-Bit
3 //Scilab - 6.0.1
4
5
6 //AIM:  Develop a program for Performing Frequency
      modulation using SCILAB code
7
8
9 clear ;
10 clc;
11 t=0:0.0001:0.1;
12 vm=input ("Enter the value of modulating volatge =")
      ); // vm = 5
13 fm=input ("Enter the value of modulating frequency="
```

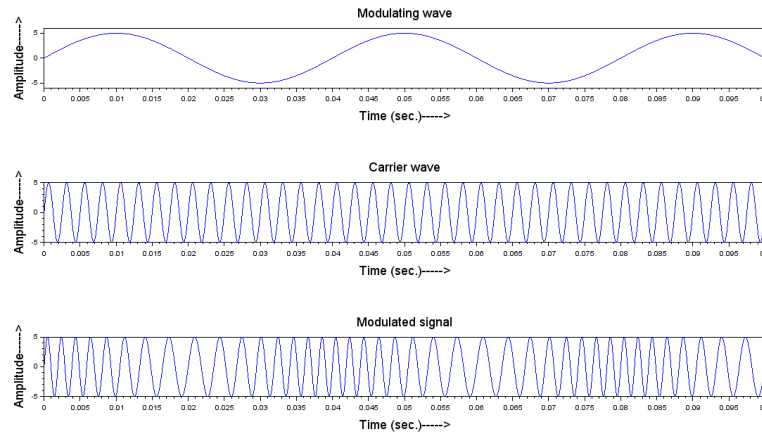


Figure 13.1: Frequency Modulation

```

); // fm =25
14 vc=input ("Enter the value of carrier volatge =");
    // vc = 5
15 fc=input (" Enter the value of carrier frequency=");
    //(fc>f) fc = 400
16 m=input("Enter the value of modulation index ="); //
    m = 5
17 //Generation of carrier signal
18 v1=vc*sin(2*%pi*fc*t);
19 subplot (312);
20 plot (t,v1);
21 xlabel("Time (sec.)——>" ," fontsize",4);
22 ylabel(" Amplitude——>" ," fontsize",4);
23 title(" Carrier wave" ," fontsize",4);
24 //generation of Modulating wave
25 v2=vm*sin(2*%pi*fm*t);
26 subplot(311);
27 plot (t,v2);
28 xlabel("Time (sec.)——>" ," fontsize",4);
29 ylabel(" Amplitude——>" ," fontsize",4);
30 title(" Modulating wave " ," fontsize",4);
31 vfm = 5*(sin(2*%pi*fc*t+(m.*sin(2*%pi*fm*t)))) //

```

```

    Modulating Signal
32 subplot (313);
33 plot(t,vfm);
34 xlabel("Time (sec.)——>" ,"fontsize",4);
35 ylabel("Amplitude——>" ,"fontsize",4);
36 title("Modulated signal" ,"fontsize",4);
37
38 //—— consol value——
39
40 //Enter the value of modulating volatge =5
41
42 //Enter the value of modulating frequency=25
43
44 //Enter the value of carrier volatge =5
45
46 // Enter the value of carrier frequency=400
47
48 //Enter the value of modulation index =5

```

---