**Experiment No:** 02

Name of the Experiment: convolution of two signal using Tabular method in matlab

Theory: Convolution is a mathematical tool to combining two signals to form a third signal. Therefore, in signals and systems, the convolution is very important because it relates the input signal and the impulse response of the system to produce the output signal from the system. In other words, the convolution is used to express the input and output relationship of an LTI system.

Abstractly, a convolution is defined as a product of functions   and   that are objects in the algebra of Schwartz functions.

Tabular Method: This is a very simple method used for FIR systems with finite number of samples x(n). A rectangular table with N1 rows (number of elements in h(n)) and N2 columns (number elements of x(n)), or visa versa, is arranged. Then the cross multiplications are carried out. The sum of the multiplications diagonally will give the value of y(n).

Then y(n)={2,-1,2,6,-5,6} Note that N=N1+N2-1= number of elements in y(n) = 3+4-1=6 And that O1 and O2 are positions of the cursors in h(n) and x(n) (from the left), then O= O1+O2-1=2+3-1=4 which is the position of y(0).
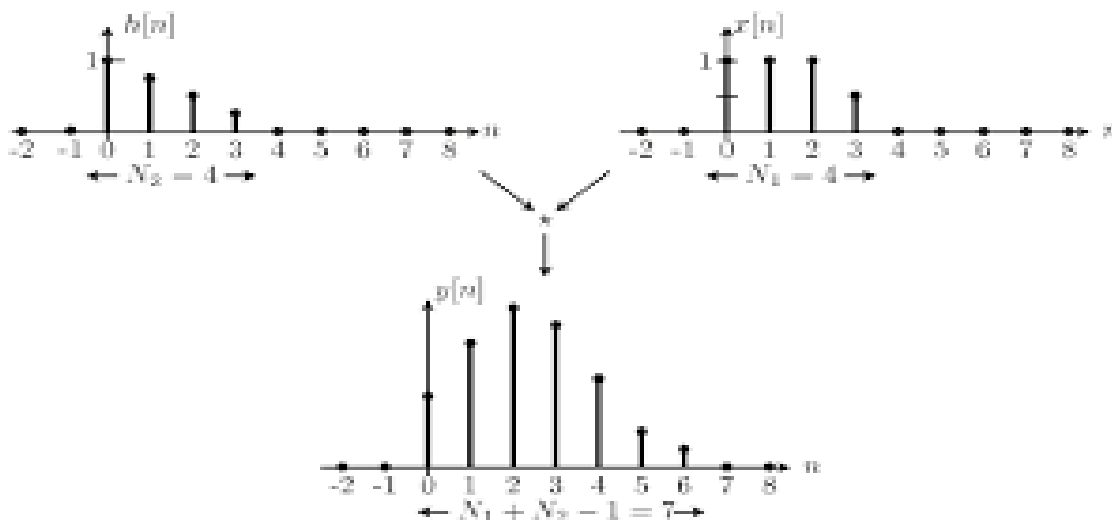
Code:

```
1. clear all
2. clc
3. x = [1 2 3 4];
4. y =  [4 4 3 2];
5. p=[];
```

```matlab
6.  k=zeros(1,8);
7.  m=length(x)
8.  n=length(y)
9.  l=0;
10.       q=1;
11.       for i=1:m
12.           for j=1:n
13.               z(i,j)=y(i).*x(j);
14.           end
15.       end
16.       for i=1:m
17.        p=i;
18.
19.           for j=1:4
20.               k(i)=k(i)+z(p,j);
21.               p=p-1;
22.               if p==0
23.                   break
24.               end
25.
26.               if i>=j
27.
28.                   continue
29.               else
30.                   break
31.
32.               end
33.           end
34.
35.       end
36.       q=1;
37.       for i=m+1:m+n-1
38.
39.               p=4;
40.               q=q+1;
41.                   for j=q:4
42.                    k(i)=k(i)+z(p,j);
43.                    p=p-1;
44.
45.
46.                   end
47.       End
```

Output:

Command Window

```
m =

     4


n =

     4


k =

     4    12    23    36    29    18     8     0

fx >>
```

Conclusion and discussion: The elements of two signal is taken as 1*4 matrix.If and break condition is used for giving the condition and breaking the loop. And nested for loop is used for fetching the value from matrix or table.

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Lab report

Course No: ECE 4124

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