

BAŞKENT ÜNİVERSİTESİ
MÜHENDİSLİK FAKÜLTESİ
ELEKTRİK - ELEKTRONİK MÜHENDİSLİĞİ
BÖLÜMÜ

EEM 301 Sinyaller ve Sistemler 1

MATLAB PROJESİ - 1

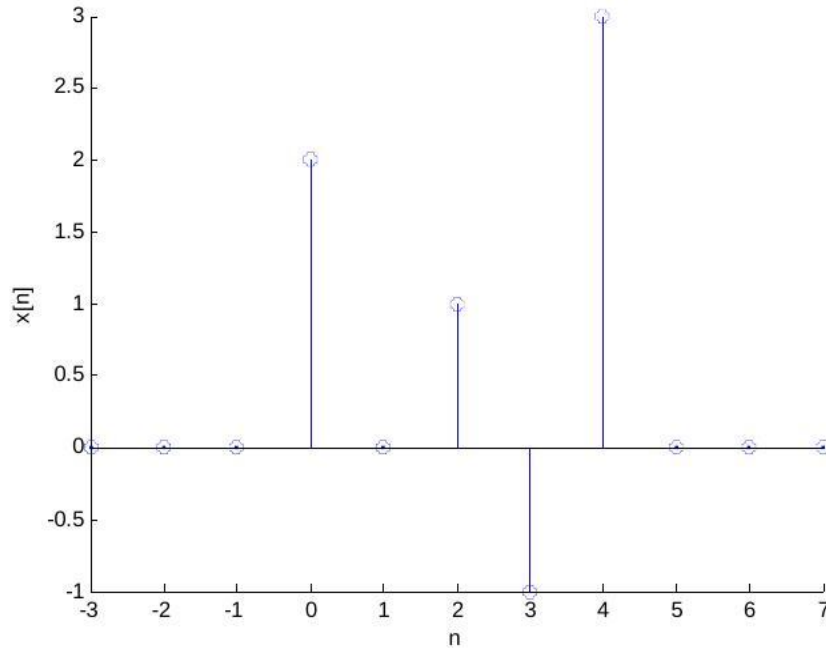


1.3

a)

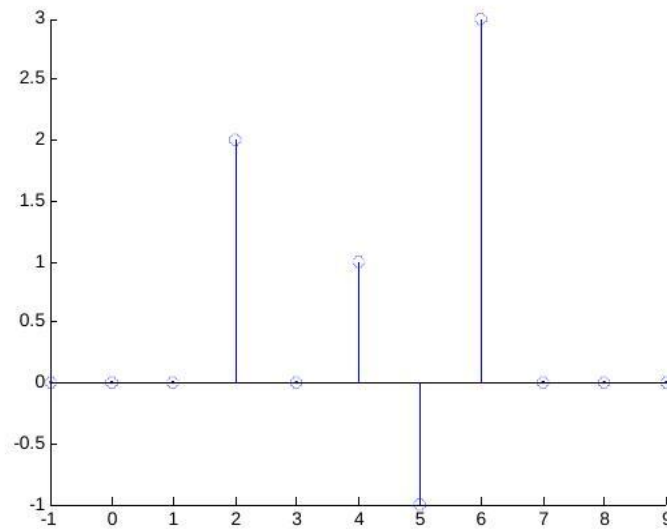
```
>> nx=-3:1:7;  
x=[0 0 0 2 0 1 -1 3 0 0 0];  
stem(nx,x)
```

Yukarıda yazılan koddan elde edilen grafik aşağıda verilmiştir.



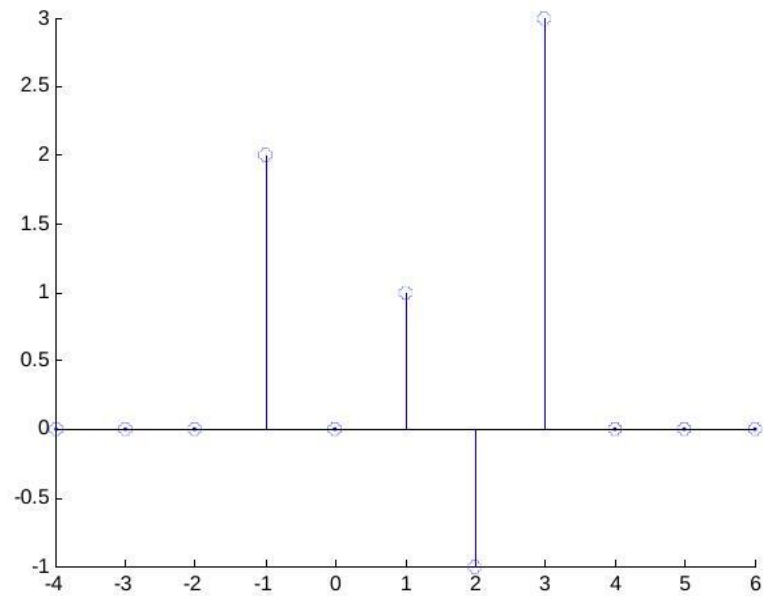
b) ve c) Soruyla ilgili MATLAB kodları ve elde edilen grafikler aşağıda verilmiştir.

```
ny1=-1:1:9;  
y1=[0 0 0 2 0 1 -1 3 0 0 0];  
stem(ny1,y1)
```



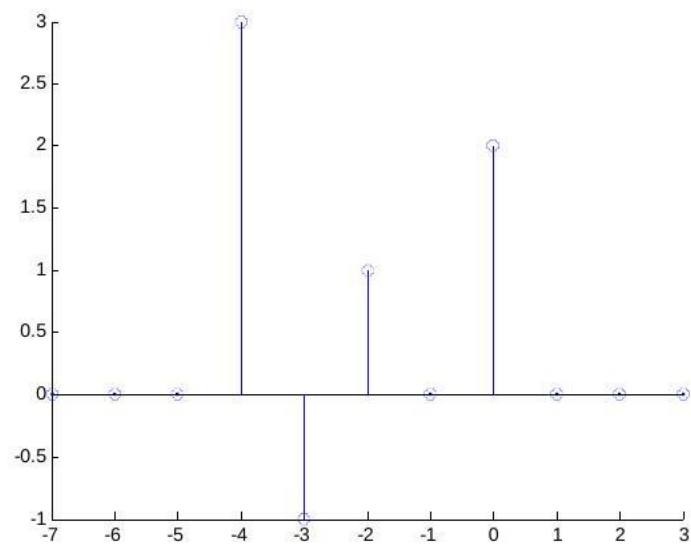
Delayed by 2

```
ny2=-4:1:6;  
y2=[0 0 0 2 0 1 -1 3 0 0 0];  
stem(ny2,y2)
```



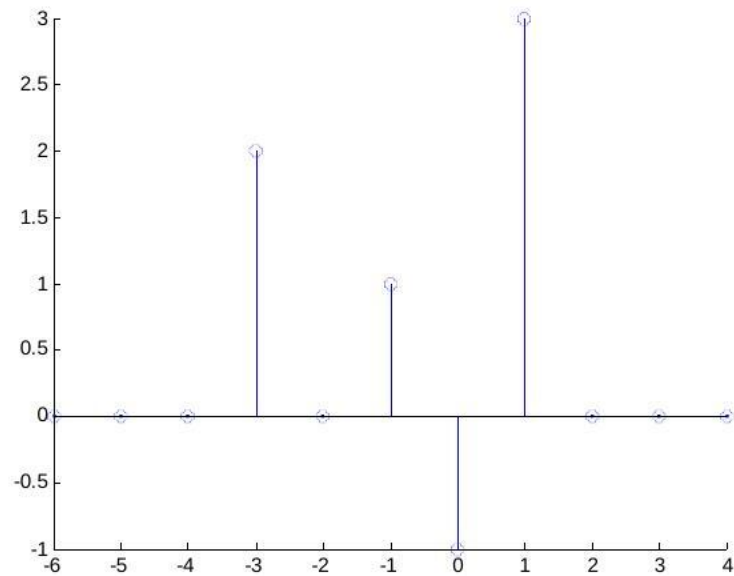
Advanced by 1

```
ny3=-7:1:3;  
y3=[0 0 0 3 -1 1 0 2 0 0 0];  
stem(ny3,y3)
```



Flipped

```
ny4=-6:1:4;
y3=[0 0 0 3 -1 1 0 2 0 0 0];
stem(ny4,y4)
```



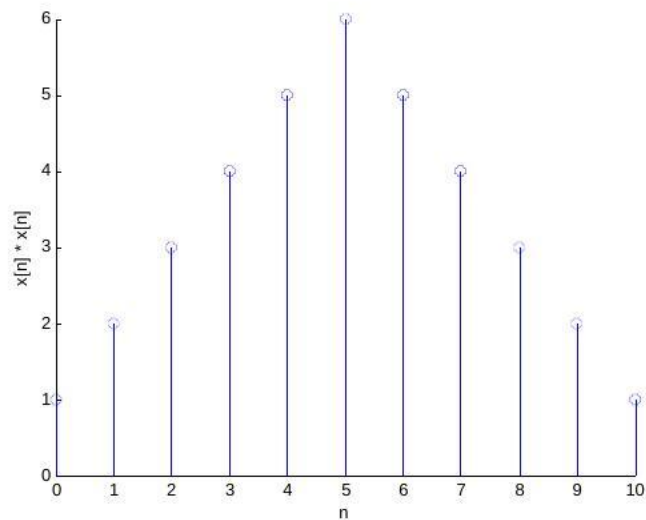
Flipped and Advanced by 1

2.1

a)
$$x[n] = \begin{cases} 1, & 0 \leq n \leq 5, \\ 0, & \text{dd}, \end{cases} \quad \text{Analitik olarak incelemesi}$$

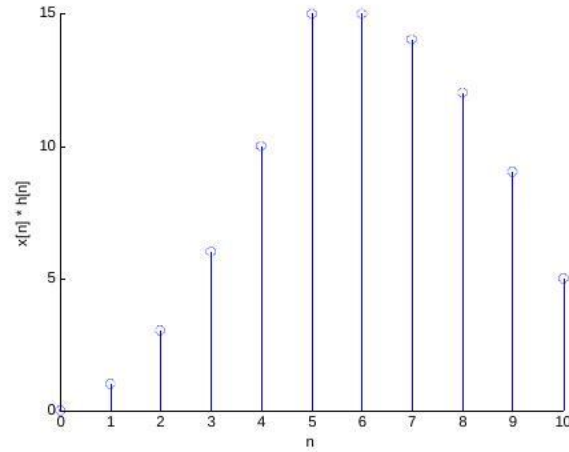
b)

```
n = [0:5];
x = [1 1 1 1 1 1];
y = conv(x,x);
ny=[0 1 2 3 4 5 6 7 8 9 10];
stem(ny,y)
```



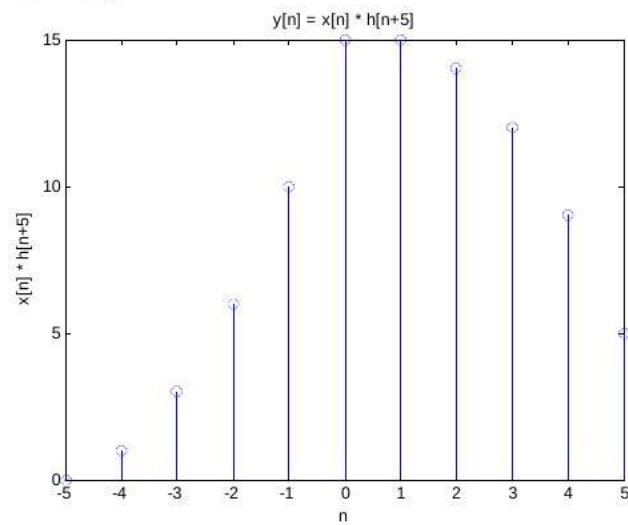
c)

```
n = [0:5];
h = n;
x = [1 1 1 1 1 1];
y = conv(x,h);
ny = [0 1 2 3 4 5 6 7 8 9 10];
stem(ny,y)
```



d)

```
nx=[0:5];
x=[1 1 1 1 1 1];
nh1=[0:5];
nh=nh1-5;
h=nh+5;
y=conv(x,h);
ny=[-5:5];
stem(ny,y)
title('y[n] = x[n] * h[n+5]');
xlabel('n');
ylabel('x[n] * h[n+5]');
```



c ve d şıklarından çıkan grafikleri incelediğimizde grafiğin 5 birim sola kaydığını (Advanced 5)

2.2

a)

```
a1 = [1];  
b1 = [0.5 1 2];
```

b)

```
a2 = [1 -0.8];  
b2 = [2];
```

c)

```
a3 = [1 -0.8];  
b3 = [0 2];
```

d)

```
a1 = [1];  
b1 = [0.5 1 2];
```

```
a2 = [1 -0.8];  
b2 = [2];
```

```
a3 = [1 -0.8];  
b3 = [0 2];
```

```
x = [1 2 3 4];
```

```
y1 = filter(b1,a1,x)
```

```
0.5000  2.0000  5.5000  9.0000
```

```
y2 = filter(b2,a2,x)
```

```
2.0000  5.6000  10.4800  16.3840
```

```
y3 = filter(b3,a3,x)
```

```
0  2.0000  5.6000  10.4800
```

2.7

a)

$$h[n] = \begin{cases} 2 & n = -1, \\ -2 & n = 1, \\ 0 & \text{d.d.}, \end{cases}$$

$$x[n] = \begin{cases} 1 & n = 0, \\ 1 & n = 2, \\ 0 & \text{d.d.}, \end{cases}$$

$$y[n] = x[n] * h[n] \quad y[n] = \begin{cases} 2 & n = -1, \\ -2 & n = 3, \\ 0 & \text{d.d.}, \end{cases}$$

```
h = [0 2 0 -2 0 0 0];
x = [0 0 1 0 1 0 0];
ny = [-4:8]
y = conv(x,h);
stem(ny,y)
```

