Name : OM Roll no : 45 Branch : EXTC-A Date\Time : 12-9-23\2:13 EXP : 6

PS : Determine Spectrum of a known siganl using DFT and comment on the result obtain.

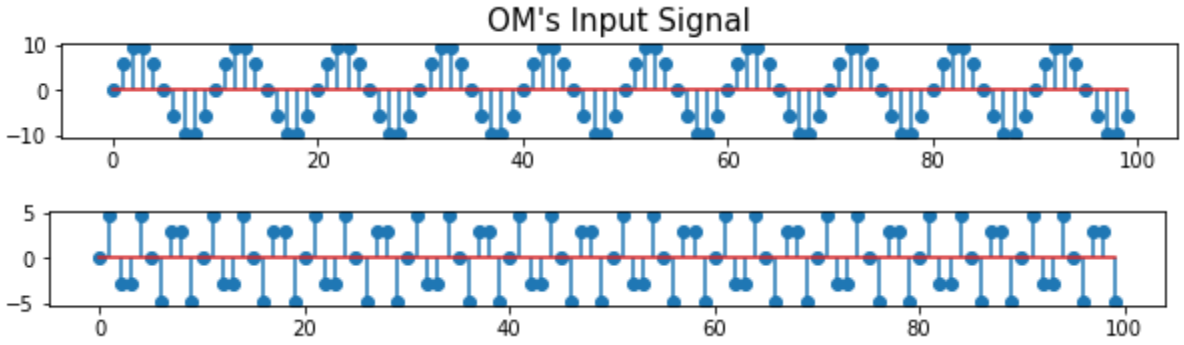
In [1]:
```
import numpy as np
import matplotlib.pyplot as plt
```

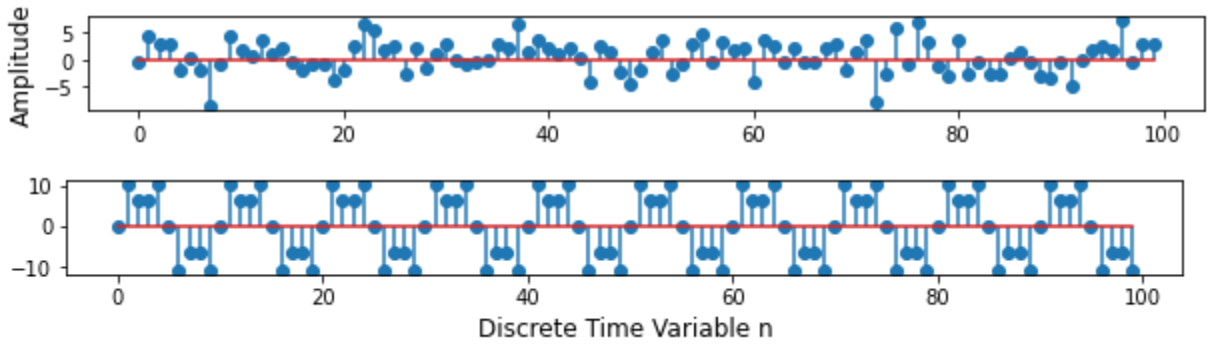
In [...
```
#sketching gtime domain representation of input signals x1(n),x2(n),x3(n)
F1=10
F2=30
Ft=100
f1=np.divide(F1,Ft)
f2=np.divide(F2,Ft)
print(f1)
print(f2)
```

```
0.1
0.3
```

In [73]:
```
n=np.arange(0,100)
x1=10*np.sin(2*np.pi*f1*n)
plt.figure(figsize=(10,4))
plt.subplot(4,1,1)
plt.stem(n,x1)
plt.title("OM's Input Signal",fontsize=15)
x2=5*np.sin(2*np.pi*f2*n)
plt.figure(figsize=(10,4))
plt.subplot(4,1,2)
plt.stem(n,x2)
x3=3*np.random.normal(0,1,100)
plt.figure(figsize=(10,4))
plt.subplot(4,1,3)
plt.stem(n,x3)
plt.ylabel('Amplitude',fontsize=12)
x=np.add(x1,x2,x3)
plt.figure(figsize=(10,4))
plt.subplot(4,1,4)
plt.stem(n,x)
plt.xlabel('Discrete Time Variable n',fontsize=12)
```

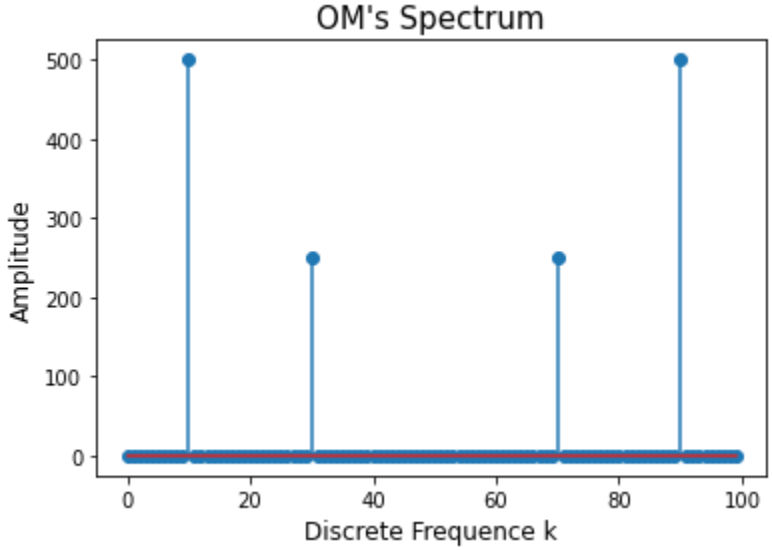
Out[73]:
```
Text(0.5, 0, 'Discrete Time Variable n')
```





In [74]:
```
#Spectrum visualization of joint sinusoidial
X=np.fft.fft(x)
X_mag = abs(X)
plt.stem(X_mag)
plt.xlabel('Discrete Frequence k',fontsize=12)
plt.ylabel('Amplitude',fontsize=12)
plt.title("OM's Spectrum",fontsize=15)
```

Out[74]:`Text(0.5, 1.0, "OM's Spectrum")`



In [ ]: