Importing necessary modules

In [1]:
```
from scipy.stats import binom
from scipy.stats import poisson
import matplotlib.pyplot as plt
import seaborn as sns
import pandas as pd
import numpy as np
```

Task 1: To find probability of finding fewer than 5 oreo customers and more than 10

In [2]:
```
p= 0.15
q= 1-p
n= 25
k= np.arange(0,5)
```

In [3]:
```
binom.pmf(k,n,p)
```

Out[3]:
```
array([0.01719781, 0.07587269, 0.16067158, 0.2173792 , 0.21098569])
```

In [4]:
```
p= 0.15
q= 1-p
n= 25
k= np.arange(10,25)
```

In [5]:
```
binom.pmf(k,n,p)
```

Out[5]:
```
array([1.64656739e-03, 3.96232795e-04, 8.15773402e-05, 1.43960012e-05,
       2.17754640e-06, 2.81800123e-07, 3.10808959e-08, 2.90375152e-09,
       2.27745217e-10, 1.48069646e-11, 7.83898125e-13, 3.29368960e-14,
       1.05679880e-15, 2.43252921e-17, 3.57724884e-19])
```

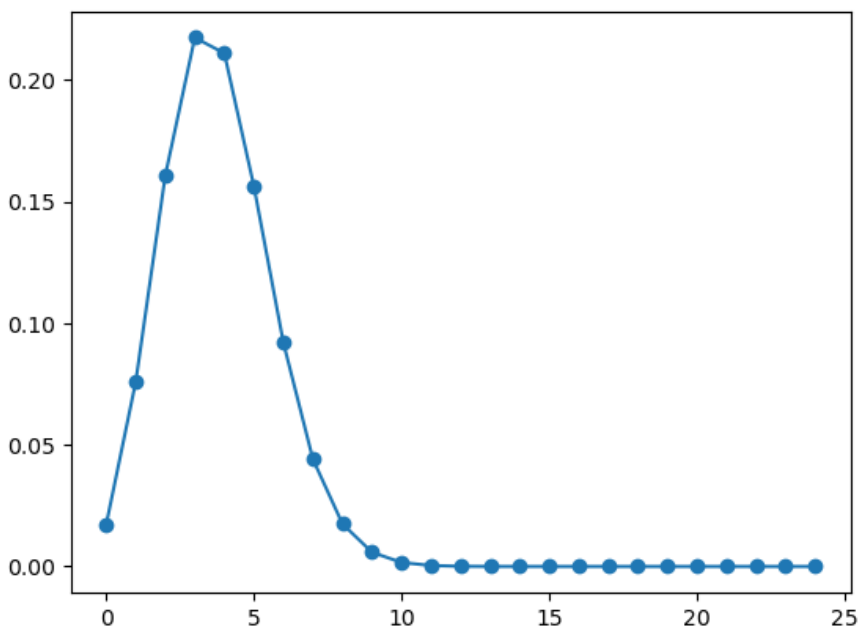
Task1.1: To find mean and standard dev and plot distribution

In [6]:
```
mean=p*n
standard=(n*p*q)**0.5
```

In [7]:
```
p= 0.15
q= 1-p
n= 25
k= np.arange(0,25)
```

In [8]:
```
plt.plot(binom.pmf(k,n,p),"-o")
```

Out[8]:
```
[<matplotlib.lines.Line2D at 0x20b39e49b50>]
```



Task2 : To Rockin burger's restaurant

In [16]:
```

rate=np.mean([3,6,4,6,2,3,1,5,1,0,3,3,1,2,4,0,2,6,5,4,2,5,3,4,5,3,5,3,5,4,7,3,4,8,3,1])
rate_2=rate*2
rate_3=rate*3
n= np.arange(0,20)
n2=8
poisson_data= poisson.pmf(n,rate)
poisson_data_2=poisson.pmf(n,rate_2)
poisson_data_3=poisson.pmf(n2,rate_3)
```

In [17]:
```
print("Probability of zero customers coming is ",poisson_data[0])
print("Probability of 6 or more customers coming is ",poisson_data[6:].sum())
print("Probability of less than 4 customers coming is ",poisson_data_2[:4].sum())
print("Probability of customers coming in between 3 to 6",poisson_data_2[3:7].sum())
print("Probability of 8 customers in 15 minutes",poisson_data_3.sum())
```

```
Probability of zero customers coming is  0.0301973834223185
Probability of 6 or more customers coming is  0.14238644577279547
Probability of less than 4 customers coming is  0.08176541624472157
Probability of customers coming in between 3 to 6 0.42007489196817666
Probability of 8 customers in 15 minutes 0.10090247270437917
```

In [20]:
```
fig,ax=plt.subplots(2,1,figsize=(10,12))
ax[0].plot(poisson_data,"-o")
ax[0].set_title("Poission one")
ax[1].set_title("Possion two")
ax[1].plot(poisson_data_2,"-o")
plt.show()
```