Q1:

(1)

```
import numpy as np
import scipy.special as sp
import matplotlib.pyplot as pl

comb= sp.comb
n=10
x= np.arange(0,n+1)
c= comb(n,x)

def binom(x,n,p):
    prob= comb(n,x) * p**x * (1-p)**(n-x)
    return prob

b= binom(x, n=10, p=1/10)
x, b
```

```
(array([ 0,  1,  2,  3,  4,  5,  6,  7,  8,  9, 10]),
 array([0.34867844, 0.38742049, 0.19371024, 0.05739563, 0.0111602
6,
        0.00148803, 0.00013778, 0.00000875, 0.00000036, 0.00000001,
        0.        ]))
```

(2)

n=10

p=1/10

E[X]=n*p

E[X]=0.1

(3)

$Std[x] = \sqrt{n * p * (1-p)} = \sqrt{10 * 0.1 * 0.9} = 0.9487$

(4)

$\sum_{x=10}^{10}(x; 10 * \frac{100-x}{100})$

Q3:

(1)

P(X>=10)=1-(P0)-P(1)-.....P(9)=1-b(0;100,0.05)-b(1;100,0.05)-.....b(9;100,0.05)

(2)

P(x>=10|p=5%)=P(x>=10)

”p=5%”->”x>=10”機率很小，但 x>=10 確實發生

p→q　~q→~p　p →~q　q→~p

Q4:

b(x;n,p) →$(C_x^n)*P^x*q^{n-x}$

p(x;μ) →$\frac{\mu^x}{x!}*e^{-\mu}$

n→∞

p→0

np=μ