IB Computer Science **Name : JunsooYoon**

Exam 2

1) Write the output of the following programs. (10 points each)

a.

```
a=[0,1]
for i in range(1,5):
      a=a+[a[i]+a[i-1]]
print a
```

```
[0,1,1,2,3,5]
```

b.

```
a=[]
for i in range(4):
    b=[]
    for x in range(3):
        b=b+[i+2*x]
    a=a+[b]
print a
```

```
[[0,2,4],[1,3,5],[2,4,6],[3,5,7]]
```

c.

```
a=[1,3,4,2,8]
b=[]
for i in range(len(a)-1):
    b=b+[a[i+1]-a[i]]
print b
```

```
[2,1,2,6]
```

2) Write the output of the following programs. (10 points each)

a. Write a program that prints the sum of 100 random number between 0 and 1.

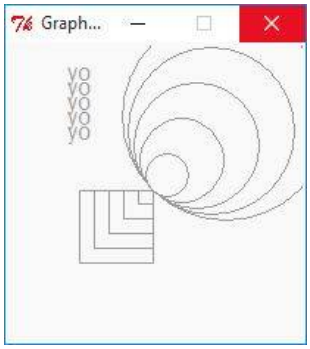
```
Import random
S=0
For i in range(100):
S=s+random.uniform(0,1)
Print s
```

b. Write a program that prints the average value of an array "a".

```
a=[n,n+1,n+2,n+3,n+4,n+5]
print sum(a)/len(a)
```

c. Write a program that builds a 10 by 10 checkerboard array of ones and zeros.

```
Import random
xx=[]
for i in range(10):
r=xx+[range(10)]
b=range(10)
t=3.0
for j in range(10):
for i in range(10):
if random.uniform(0,10)<t:
r[i][j]=1
else:
r[i][j]=0
print r
```



3) Draw the output of the following program. (20 points)

```
from graphics import *


win=GraphWin()
win.setCoords(-10,-10,10,10)


for i in range(1,6):
    circ=Circle(Point(i,i),(2**0.5) * i)
    rec=Rectangle(Point(-i,-i),Point(0,0))
    t = Text(Point(-5,9-i), "yo")
    circ.draw(win)
    rec.draw(win)
    t.draw(win)
```

4) Perform the following conversions. (10 points each)

a. Convert the Base5 number 432 to Base10.

97

b. Convert the binary number 1010001 to Base10.

81

c. Convert the Base10 number 532 to Base5.

4112