1- **In randomised response technique (RRT), if we have p_0=0.4, Pr[Yes|N]=0.7,**

   and total probability from survey is: Pr[Yes]=0.7, find the Pr[Yes| E] =?

      (Hint: See page 51)   *10%*

2- **For the following two dimensional transformation:**

           w=x-y

           z=x+y

   Find the joint pdf of f(w,z), if the the joint pdf of f(x,y), has the following Normal distribution:

                EMBED Equation.3

      (Hint: See page 35)   *10%*

3- **In the mixed congruential generator: EMBED Equation.3**

   Simulate the first five numbers with seed   EMBED Equation.3   . Then find the correlation between two successive numbers.

   5%

                                              5%

           (Hint: See page 60-61)

4- **Simulate the normal distributed random variables (N1, N2) by using The Box-Muller method from the following U1, U2 uniform distributed random variables:**

   U1=0.3, U2=0.5   *10%*

           (Hint: See page 78 Eq. 4.1)

5- **Simulate the Gamma distributed random variables, G, with EMBED Equation.3**

for n=5, EMBED Equation.3 from the following uniform distributed random variables, U(0,1):

U1=0.9, U2=0.7, U3=0.6, U4=0.2, U5=0.4   *10%*

(*Hint: See page 82*)

6- Two independent uniform random numbers with U(0,1) are given in the binary form as below: U1=0.10110110

U2=0.10111110

Simulate the binomial distribution B(8,1/2) random variables, X1, from U1 and X2, with B(8,1/4) from U1 and U2.   *10%*

(*Hint: See page 83*)

7- Simulate a Poisson distribution random variable, K, with parameter EMBED Equation.3 from the following uniform random variables: U1= 0.8, U2= 0.8, U3= 0.6, U4= 0.5

10%

(*Hint: See page 84*)

8-Simulate the random variable X with the following probabilities:

(*Hint: see page 93*)

From a U(0,1) in the following table: *10%*

9-Simulate random variable X with geometric distribution and p=0.5 from U(0,1) =0.3

(Hint: See page 93 Eq. 5.4)   *10%*

I	0	1	2	3	4	5	6
Pr [X<I]	0.2	0.3	0.6	0.7	0.9	0.92	0.95

X1=
X2=

 EMBED Equation.3

X=

U	0.15	0.55	0.35	0.65	0.75	0.85	0.93
X							

x(0)=1,   x(1)=   ,x(2)=   ,x(3)=   ,x(4)=   , x(5)=

Pr[Yes | E] =

f(w,z)=

N1=   ,N2=

G=

K=