**Assignment for Chapter 8**

**Random-Variate Generation**

**Problem 1:**

Let the probability density function of random value x be an exponential distribution with mean 1/λ= 2 minutes. Use the uniform random number generator in EXCEL to produce 10 consecutive values of x.

**Problem 2:**

Let the probability density function of random value x be an exponential distribution with mean 4 minutes. Use the uniform random number generator in EXCEL to produce 10 consecutive values of x.

**Problem 3:**

Let the following probability distribution of random variable x be

|  |  |  |
| --- | --- | --- |
| Interval i | x | probability |
| 1 | 0<x≤3 | 0.22 |
| 2 | 3<x≤7 | 0.18 |
| 3 | 7<x≤9 | 0.11 |
| 4 | 9<x≤11 | 0.09 |
| 5 | 11<x≤17 | 0.23 |
| 6 | 17<x≤20 | 0.17 |

If we know that the distribution of x is continues,

* find the inverse cumulative distribution of X
* generate 8 random values (use EXCEL), and get the corresponding x’s

**Problem 4:**

Let the following probability distribution of random variable x be

|  |  |  |
| --- | --- | --- |
| Interval i | x | probability |
| 1 | 0<x≤2 | 0.12 |
| 2 | 2<x≤4 | 0.19 |
| 3 | 4<x≤8 | 0.21 |
| 4 | 8<x≤12 | 0.17 |
| 5 | 12<x≤14 | 0.22 |
| 6 | 14<x≤18 | 0.09 |

If we know that the distribution of x is continues,

* find the inverse cumulative distribution of X
* generate 8 random values (use EXCEL), and get the corresponding x’s

**Problem** 5:

Assume Y is an Erlang random variable with parameters K equals 5 and ϴ equals 0.1. Use the convolution method to generate an Erlang random value of Y.

**Problem 6:**

Assume Y is an Erlang random variable with parameters K equals 4 and ϴ equals 0.25. Use the convolution method to generate an Erlang random value of Y.

**Problem 7:**

Assume Y is a poisson random variable with mean 8. Use the Acceptance- Rejection technique to generate a poisson random value of Y.

**Problem 8:**

Assume Y is a poisson random variable with mean 12. Use the Acceptance- Rejection technique to generate a poisson random value of Y.