King Abdul Aziz University
Department of Statistics

Assignment 4 (Mathcad part)
Stat 210 LAB
Term 2, 2015
I. Abeer Balubaid

Name:_____

ID:_____

Section:_____

Marks Obtained:_____

The due date Sunday 14/7/1436 H

Question#1:

Write a "Binomial" function that return the probability density function f(x) and cumulative function F(x) for any value of variable and parameters(n,θ) that send them to a function

Example:

Binomial(10,30,0.6) this function return $\begin{pmatrix} 0.001997 \\ 0.002854 \end{pmatrix}$

Question#2:

Assume that: x is a random variable follow the Poisson distribution with parameter $\lambda = 2$, then:

1. Write a probability density function $f(x) = \frac{e^{-\lambda}\lambda^x}{x!}$ and draw it when x=0,1,..,10

2. Write a cumulative distribution F(x) and draw it when x=0,1,..10.

3. Draw in one graph a probability and cumulative functions (f(x) and F(x))

4. Find a random sample of size 7 using: rpois(size,λ).

5. By using Built-in function find f(x) and F(x), when x=5 using: dpois(x,λ) and ppois(x,λ).

6. Find the mean, variance and standard deviation of distribution (mean=variance= λ).

7. Find the following probability:

a. P(x<5)

b. P(x=4)

c. P(2 $\leq$ x < 5)

d. P(x $\geq$ 8)

Question#3:

If y ~ binomial (18,0.76), then find the following: **(By using Built-in functions)**

1. the probability that y is at least15

2. the probability that y is less than 14 and at least 12

3. the probability that y is 20

4. the probability that y is at most 18.

Question#4:

Assume that: x is a random variable follow standard normal distribution, then:

1. Write a probability density function

$$f(x) = \frac{1}{\sqrt{2\pi}} e^{\frac{-x^2}{2}} \ , \ -\infty < x < \infty$$

and draw it when x=-5,-4.5,...,0,0.5,...,5

2. Write a cumulative distribution F(x) and draw it.

3. Write a reliability function S(x) and draw it.

4. Write a hazard function H(x) and draw it.

5. Draw f(x), F(x), S(x) and H(x) in one graph.

6. Find the following probability by using built-in function (dnorm(x,0,1) and pnorm(x,0,1))

a. $P(x \leq 2.3)$

b. $P(x=1.5)$

c. $P(2.5 \leq x \leq 3.1)$

d. $P(x > 1.24)$