Appendix 1 UDPS2073 Final Assessment

##Question 1 (a)

$$f(x,y) = \begin{cases} cx^3y(1+y^5) & \text{for } 0 \leq x \leq 5 \text{ and } 0 \leq y \leq 5 \\ 0 & \text{otherwise} \end{cases} \tag{1}$$

Question 1 (b)

```
##           Package.I Package.II Package.III
## Package A         9          9           8
## Package B        12         11           9
## Package C        11         10          14
## Package D        14         12          10
```

The total number of patients is 129.

##Question 2 (a) (i)

$$f(x_1) = \frac{1}{5}\exp^{-x_1/5},\ x_1 > 0$$
$$f(x_2) = \frac{1}{4}\exp^{-x_2/4},\ x_2 > 0$$

Question 2 (a) (ii)

$$Y_1 = 4X_1 + 5X_2$$
$$Y_2 = 4X_1 - 5X_2$$

Question 2 (b)

The distribution of X_i is a geometry distribution and the number of random variables, n is 62.

Question 3 (a)

The directory of the 500 samples is

```
## [1] "C:/Users/user/Downloads /UDPS2073_3_a.csv"
```

Question 3 (b) (i)

The $\alpha = 8$. You are the number 8^{th} people in the queue.

Question 3 (b) (ii)

```
## [1] "C:/Users/user/Downloads /UDPS2073_3_b.csv"
```

Question 4 (a)

The variance is

$$\sigma^2 = \frac{6}{n^5}$$

.

Question 4 (b)

The distribution of Z_n is exponential distributed with mean equals to n and standard deviation equals to n . The random variables Y_n,

$$Y_n = \frac{Z_n - \mu}{\sigma}$$

with μ and σ are the mean and standard deviation for the above distribution, respectively.