(1) If $F_{XY}(x,y) = (1-e^{-ax})(1-e^{-by})$ for $x \geq 0, y \geq 0$

$= 0$ otherwise

Given $a>0, b>0$

1) Find CDF of X
2) Find $P(Y>1)$.

(2) Show that $E\{E(X/Y)\} = E\{X\}$

(3) Define
1) mean & correlation of Random process
2) time Averages of a Random process.
3) wide sense stationarity
4) Ergodic R.P.

(4) Two bowls contain R, G, B balls as follows

B1: 2, 7, 9 $\quad$ B2: 14, 3, 5

A ball is drawn randomly. and it is given that a green ball is selected, what is the prob it has drawn from Bowl 2

(5) Given $Z(t) = A \sin(\omega t)$ & A is a R.V with $E\{A^2\} = 5$. Find out whether $Z(t)$ is correlation ergodic.

Let

(6) Given $X_1, X_2 \cdots X_n$ are $N$ Random variable following Gaussian distribution.

If $\text{Cov}(X_i, X_j) = 0 \quad \forall\, i \neq j$

$= \sigma \quad i = j$

then Show that they are independent R.V