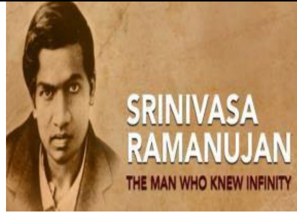

SRM Institute of Science and Technology
Kattankulathur

DEPARTMENT OF MATHEMATICS

18MAB203T Probability and Stochastic Processes

Module – II: Two dimensional Random Variables
Tutorial Sheet - VI

Sl.No.	Questions	Answer
	Part – B	
1	If X and Y each follow an exponential distribution with parameter 1 and are independent, Find the pdf of U= X -Y	
2	Given the joint density function of X and Y as $f(x,y)=\begin{cases}\frac{1}{2}xe^{-y} & 0<x<2,\ y\geq 0\\ 0 & otherwise\end{cases}$ Find the density function of X+Y.	$g_U(u)=\begin{cases}\frac{1}{2}\left(u+e^{-u}-1\right) & ,0<u\leq 2\\ \frac{1}{2}\left(e^{u}(1+e^{2})\right) & ,2<u<\infty\\ 0 & otherwise\end{cases}$
3	Let (X, Y) be the two-dimensional random variable and the joint pdf is given by $f(x,y)=\begin{cases}e^{-(x+y)} & x\geq 0,\ y\geq 0\\ 0 & otherwise\end{cases}$ Find the pdf of $U=\dfrac{X+Y}{2}$.	(i) $g_U(u)=4ue^{-2u} \quad u>0$
	Part – C	
4	The R.V X & Y as the joint pdf $f(x,y)=\begin{cases}24xy & x\geq 0,\ y\geq 0,\ x+y=1\\ 0 & otherwise\end{cases}$ Show that U=X+Y, V = X/Y are independent.	
5	The joint pdf of the two-dimensional random variable is given by $f(x,y)=x+y \quad 0\leq x,y\leq 1$.Find the pdf of U= XY	$g_U(u)=2(1-u) \quad 0\leq u\leq 1$
6	If X& Y are independent standard normal variable. Find the Probability distribution of U = X/Y	$g_U(u)=\dfrac{1}{\pi(1+u^2)} \quad -\infty<u<\infty$