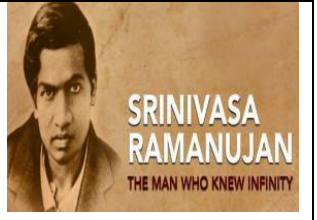
SRM Institute of Science and Technology
Kattankulathur

DEPARTMENT OF MATHEMATICS

18MAB203T Probability and Stochastic Processes

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



Sl.No.	Questions	Answer
	Part – B	
1	If X and Y are independent RVs with means 2 and 3 and variance 1 and 2 respectively, find the mean and variance of Z = 2X -5Y.	(i) -11 (ii) 54
2	If the joint distribution function of X and Y is given by $F(x,y)=\begin{cases}(1-e^{-x})(1-e^{-y}) & for\ \ x>0, y>0\\ 0 & otherwise\end{cases}$ Find the Joint P.D.F	$f(x,y)=e^{-(x+y)},\ x>0, y>0$
3	Let X & Y have the following joint probability distribution Y / X: 2 → 0.10, 4 → 0.15; 2 → 0.20, 4 → 0.30; 3 → 0.10, 4 → 0.15 Show that X & Y are independent.	X & Y are independent
4	If the joint pdf of (X, Y) is given by $f(x,y)=2 \quad 0\le x\le y\le 1$ Find E(X).	1/3
	Part – C	
5	Let X_1 & X_2 have the joint pmf $P(x_1,x_2)=\frac{x_1+2x_2}{18} \qquad x_1=1,2;\ x_2=1,2$ Find the $Cov(X_1,X_2)$.	(i) E (X1) =14/9 (ii) E(X2) =29/18 (iii) E(X1X2) =45/18 (iv) Cov (X1, X2) = -1/162
6	Let X & Y be the random variables having the following joint probability distribution Y / X: 0 → 3/28, 1 → 9/28, 2 → 3/28; 1 → 3/14, 3/14, 0; 2 → 1/28, 0, 0 Find the Cov (X, Y).	(i) E (X) =3/4 (ii) E(Y)=1/2 (iii) E(XY)= 3/14 (iv)Cov (X, Y) = 9/56

7	The Joint probability density function of X and Y is given by $f(x,y) = \begin{cases} x+y, & 0 \le x \le 1, \ 0 \le y \le 1 \\ 0 & otherwise \end{cases}$ Obtain the correlation coefficient between X and Y.	(i) -0.09
8	Two random variable X and Y have joint density function $f(x,y) = \begin{cases} 2-x-y, & 0 \le x \le 1, \ 0 \le y \le 1 \\ 0 & otherwise \end{cases}$ Find Cov (X, Y) and Correlation Coefficient of X and Y	(i) – 1/144 (ii) - 0.09