SRM Institute of Science and Technology
Department of Mathematics
18MAB203T-Probability and Stochastic Processes
Assignment –II

1. The following table represents the joint probability distribution of the discrete random variable (X,Y). Find all the conditional distributions.

Y	X		
	1	2	3
1	1/12	1/6	0
2	0	1/9	1/5
3	1/18	1/4	2/15

2. If the joint probability density function of an two dimensional random variable (X,Y) is given by $f(x,y)=\begin{cases}k(6-x-y), & 1<x<2;2<y<4\\ 0, & \text{elsewhere}\end{cases}$. Find (i) the value of k, (ii) $P(X<1,Y<3)$, (iii) $P(X+Y<3)$ and (iv) $P(X<1/Y<3)$.

3. If X and Y are independent random variables having pdfs $f(x)=2e^{-2x}, x>0$ and $f(y)=3e^{-3y}, y>0$. Find the pdfs of U and V.

4. Let X and Y be two r.v.'s each taking three values -1, 0 and 1 and having the joint probability mass function as given below

Y X	-1	0	1
-1	0	0.1	0.1
0	0.2	0.2	0.2
1	0	0.1	0.1

Find the correlation coefficient between X and Y.

5. If X is a random variable with $E(X)=3$ and $E(X^2)=13$, find the lower bound for $P(-2<X<8)$, using Tchebycheff's inequality.

6. If $V_i, i=1,2,...20,$ are indepnoise voltages received in an 'adder' and V is the sum of the voltages received, find the probability that the total incoming voltage V exceeds 105, using CLT. Assume that each of the r.v.'s V_i is uniformly distributed over (0,10).