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

1. A random variable X has the following probability distribution:

x	0	1	2	3	4	5	6	7	8
$p(x)$	a	$3a$	$5a$	$7a$	$9a$	$11a$	$13a$	$15a$	$17a$

Find the value of $a, P(X<3)$ and distribution function of X.

2. The density function of a random variable X is given by $f(x)=kx(2-x),\ 0\le x\le 2,$ find k, mean and variance.

3. The diameter of an electric cable say X is assumed to be a continuous random variable with $f(x)=\begin{cases}6(x-x^2), & 0\le x\le 1\\ 0, & \text{otherwise}\end{cases}$. Check whether $f(x)$ is a probability density function. Also find $P\left(X\le\frac{1}{2}\Big/\frac{1}{2}<X<\frac{2}{3}\right)$.

4. In a electronic laboratory, it is found that 10% of transistors are defective. A random sample of 20 transistors are taken for inspection. What is the probability that (i) atmost 3 are good and (ii) atleast 3 are good.

5. The marks of the students are normally distributed 10% get more than 75 marks and 20% get less than 40% marks. Find the mean and standard deviation of the distribution.

6. Let X be a random variable with density function $f_X(x)=2x,\ 0<x<1.$ Find the probability density function of $Y=3X+6.$