Jaypee University of Engineering & Technology,Guna
Probability Theory and Random Process (MA106)
Tutorial-3

1. The RV X has the following probability distribution :

x :	-2	-1	0	1
P(x) :	0.4	k	0.2	0.3 .

Find k and mean value of X.

2. A shipment of 6 television sets contains 2 defective sets. A hotel makes a random purchase of 3 of the sets. If X represents the no. of defectives in the lot purchased, find the probability distribution of X.

3. A random variable X may assume 4 values with probability $\frac{1+3x}{4}, \frac{1-x}{4}, \frac{1+2x}{4}, \frac{1-4x}{4}$. Find the probability on x so that these values represent the probability of x.

4. If the random variable X takes the values 1,2,3 and 4 such that

$2P(X=1)=3P(X=2)=P(X=3)=5P(X=4)$, find the probability distribution and cumulative distribution of X.

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

x :	-2	-1	0	1	2	3
P(x) :	0.1	k	0.2	2k	0.3	3k

(i) Find k (ii) evaluate $P(X<2)$ and $P(-2<X<2)$ (iii) find cdf of X, and evaluate the mean of X.

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

x :	0	1	2	3	4	5	6	7
P(x) :	0	2λ	2λ	λ	3λ	λ^2	$2\lambda^2$	$7\lambda^2+\lambda$

(i) Find the value of λ (ii) evaluate $P(1.5<X<4.5 \mid X>2)$ (iii) the smallest value of K for which $P(X \le K) > \frac{1}{2}$.

7. A discrete 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	18a	15a	17a

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