Department of Computer Applications
23MX11 – Discrete Random Variables Problem Sheet – October 2023

1. 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

a) Find k **b)** Evaluate P(X<2) and P(-2<X<2) **c)** Evaluate the Mean of X

2. A random variable X has the following probability distribution.

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

Find k and the mean value of X.

3. 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), Mean and Variance of X

4. A random variable X has the following probability distribution.

X:	0	1	2	3
P(X)	0.1	0.3	0.5	0.1

If $Y = X^2+X$, find the probability distribution, Mean and Variance of Y.

5. If the Probability Mass Function of a random variable X is given by $P(X=r) = kr^3$; r = 1, 2, 3, 4. Find i) the value of k; ii) Probability distribution function of X; iii) $P\left(\frac{1}{2} < X < \frac{5}{2} \mid X > 1\right)$; iv) Mean and Variance of X.

6. Assume that the pair of dice is thrown and the random variable X is the sum of numbers that appears on two dice. Find the mean and variance of the random variable X