1. State which of the following are not the probability distributions of a random variable. Give reasons for your answer.

(i)

X	0	1	2
P(X)	0.4	0.4	0.2

(ii)

X	0	1	2	3	4
P(X)	0.1	0.5	0.2	-0.1	0.3

(iii)

Y	-1	0	1
P(Y)	0.6	0.1	0.2

(iv)

Z	3	2	1	0	-1
P(Z)	0.3	0.2	0.4	0.1	0.05

2. Find the probability distribution of

(i) number of heads in two tosses of a coin

(ii) number of tails in the simultaneous tosses of three coins

(iii)number of heads in four tosses of a coin

3. A coin is biased so that the head is 3 times as likely to occur as tail. If the coin is tossed twice, find the probability distribution of number of tails.

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

X	0	1	2	3	4	5	6	7
P(X)	0	k	2k	2k	3k	k^2	$2k^2$	$7k^2 + k$

Determine i) k ii) P(X<3) iii) P(X>6) iv) P(0<x<3)

5. The random variable X has probability distribution P(X) of the following form, where *k* is some number:

$$P(X) = \begin{cases} k, if\ x = 0 \\ 2k, if\ x = 1 \\ 3k, if\ x = 2 \\ 0, otherwise \end{cases}$$

(a) Determine the value of *k*.

(b) Find $P(X < 2)$, $P(X \geq 2)$, $P(X \geq 2)$.

6. Let X be a discrete random variable with a probability function

Values of $X : x$	1	4	9
$f(x)$	0.1	0.4	0.5

Find the mean of $X, X^2, \sqrt{X}$ and $2\sqrt{X}$.