Probability distribution table

Question Paper 2

Level	International A Level
Subject	Maths
Exam Board	CIE
Topic	Descrete random variables
Sub Topic	Probability distribution table
Booklet	Question Paper 2

Time Allowed: **59 minutes**

Score: **/ 49**

Percentage: **/100**

Grade Boundaries:

A*	A	B	C	D	E	U
>85%	'77.5%	70%	62.5%	57.5%	45%	<45%

1 Ashok has 3 green pens and 7 red pens. His friend Rod takes 3 of these pens at random, without replacement. Draw up a probability distribution table for the number of green pens Rod takes. [4]

2 The discrete random variable X has the following probability distribution.

x	-3	0	2	4
$P(X = x)$	p	q	r	0.4

Given that $E(X) = 2.3$ and $Var(X) = 3.01$, find the values of p, q and r. [6]

3 A team of 4 is to be randomly chosen from 3 boys and 5 girls. The random variable X is the number of girls in the team.

(i) Draw up a probability distribution table for X. [4]

(ii) Given that $E(X) = \frac{5}{2}$, calculate $Var(X)$. [2]

4 The discrete random variable X takes the values 1, 4, 5, 7 and 9 only. The probability distribution of X is shown in the table.

x	1	4	5	7	9
$P(X = x)$	$4p$	$5p^2$	$1.5p$	$2.5p$	$1.5p$

Find p. [3]

5 In a probability distribution the random variable X takes the value x with probability kx, where x takes values 1, 2, 3, 4, 5 only.

(i) Draw up a probability distribution table for X, in terms of k, and f nd the value of k. [3]

(ii) Find E(X). [2]

6 The probability distribution of the random variable X is shown in the following table.

x	−2	−1	0	1	2	3
P($X = x$)	0.08	p	0.12	0.16	q	0.22

The mean of X is 1.05.

(i) Write down two equations involving p and q and hence f nd the values of p and q. [4]

(ii) Find the variance of X. [2]

7 In a particular discrete probability distribution the random variable X takes the value $\frac{120}{r}$ with probability $\frac{r}{45}$, where r takes all integer values from 1 to 9 inclusive.

(i) Show that P($X = 40$) = $\frac{1}{15}$. [2]

(ii) Construct the probability distribution table for X. [3]

(iii) Which is the modal value of X? [1]

(iv) Find the probability that X lies between 18 and 100. [2]

8 A fair die has one face numbered 1, one face numbered 3, two faces numbered 5 and two faces numbered 6.

(i) Find the probability of obtaining at least 7 odd numbers in 8 throws of the die. [4]

The die is thrown twice. Let X be the sum of the two scores. The following table shows the possible values of X.

		Second throw					
		1	3	5		6	6
	1	2	4	6		7	7
	3	4	6	8		9	9
First	5	6	8	10	10	11	11
throw	5	6	8	10	10	11	11
	6	7	9	11	11	12	12
	6	7	9	11	11	12	12

(ii) Draw up a table showing the probability distribution of X. [3]

(iii) Calculate E(X). [2]

(iv) Find the probability that X is greater than E(X). [2]