Probability

Question Paper 1

Level	International A Level
Subject	Maths
Exam Board	CIE
Topic	Probability
Sub Topic	
Booklet	Question Paper 1

Time Allowed: **52 minutes**

Score: **/ 43**

Percentage: **/100**

Grade Boundaries:

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

1 **(i)** Four fair six-sided dice, each with faces marked 1, 2, 3, 4, 5, 6, are thrown. Find the probability that the numbers shown on the four dice add up to 5. [3]

(ii) Four fair six-sided dice, each with faces marked 1, 2, 3, 4, 5, 6, are thrown on 7 occasions. Find the probability that the numbers shown on the four dice add up to 5 on exactly 1 or 2 of the 7 occasions. [4]

2 The people living in two towns, Mumbok and Bagville, are classif ed by age. The numbers in thousands living in each town are shown in the table below.

	Mumbok	Bagville
Under 18 years	15	35
18 to 60 years	55	95
Over 60 years	20	30

One of the towns is chosen. The probability of choosing Mumbok is 0.6 and the probability of choosing Bagville is 0.4. Then a person is chosen at random from that town. Given that the person chosen is between 18 and 60 years old, fin the probability that the town chosen was Mumbok. [5]

3 On Saturday afternoons Mohit goes shopping with probability 0.25, or goes to the cinema with probability 0.35 or stays at home. If he goes shopping the probability that he spends more than $50 is 0.7. If he goes to the cinema the probability that he spends more than $50 is 0.8. If he stays at home he spends $10 on a pizza.

(i) Find the probability that Mohit will go to the cinema and spend less than $50. [1]

(ii) Given that he spends less than $50, f nd the probability that he went to the cinema. [4]

4 Rory has 10 cards. Four of the cards have a 3 printed on them and six of the cards have a 4 printed on them. He takes three cards at random, without replacement, and adds up the numbers on the cards.

(i) Show that P(the sum of the numbers on the three cards is 11) = $\frac{1}{2}$. [3]

(ii) Draw up a probability distribution table for the sum of the numbers on the three cards. [4]

Event *R* is 'the sum of the numbers on the three cards is 11'. Event *S* is 'the number on the first card taken is a 3'.

(iii) Determine whether events *R* and *S* are independent. Justify your answer. [3]

(iv) Determine whether events *R* and *S* are exclusive. Justify your answer. [1]

5 In a large consignment of mangoes, 15% of mangoes are classified as small, 70% as medium and 15% as large.

(i) Yue-chen picks 14 mangoes at random. Find the probability that fewer than 12 of them are medium or large. [3]

(ii) Yue-chen picks *n* mangoes at random. The probability that none of these *n* mangoes is small is at least 0.1. Find the largest possible value of *n*. [3]

6 Ana meets her friends once every day. For each day the probability that she is early is 0.05 and the probability that she is late is 0.75. Otherwise she is on time.

(i) Find the probability that she is on time on fewer than 20 of the next 96 days. [5]

(ii) If she is early there is a probability of 0.7 that she will eat a banana. If she is late she does not eat a banana. If she is on time there is a probability of 0.4 that she will eat a banana. Given that for one particular meeting with friends she does not eat a banana, find the probability that she is on time. [4]