4.3 Conditional Probability

Question Paper

Course	CIE IGCSE Maths
Section	4. Probability & Statistics
Topic	4.3 Conditional Probability
Difficulty	Very Hard

Time allowed: 70

Score: /51

Percentage: /100

Question 1

Morgan picks three of these letters, at random, **without** replacement.

Find the probability that

i)
all three letters are the same,

[2]

ii)
exactly two of the three letters are the same,

[5]

iii)
all three letters are different.

[2]

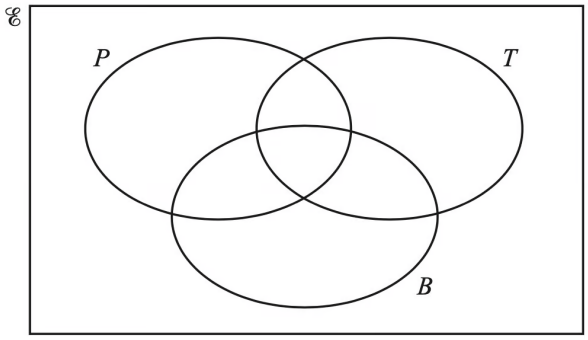
[9 marks]

Question 2a

This year, 40 students have each travelled by one or more of plane (P), train (T) or boat (B).

7 have travelled only by plane.
11 have travelled only by train.
9 have travelled only by boat.

$n(P \cap T) = 8$
$n(B \cap T) = 3$
$n(B \cap P) = 6$



Complete the Venn diagram.

[3]

[3 marks]

Question 2b

Two students are chosen at random.

Calculate the probability that they both have travelled only by plane.

[2]

[2 marks]

Question 2c

Two students are chosen at random from those who have travelled by train.

Calculate the probability that they both have also travelled by plane.

[2]

[2 marks]

Question 3a

Angelo has a bag containing 3 white counters and x black counters.
He takes two counters at random from the bag, without replacement.

Complete the following statement.

The probability that Angelo takes two black counters is $\frac{x}{x+3} \times \frac{\ldots\ldots\ldots\ldots}{\ldots\ldots\ldots\ldots}$

[2]

[2 marks]

Question 3b

The probability that Angelo takes two black counters is $\frac{7}{15}$.

i)
Show that $4x^2 - 25x - 21 = 0$.

[4]

ii)
Solve by factorisation $4x^2 - 25x - 21 = 0$.

x = ... or x = ... [3]

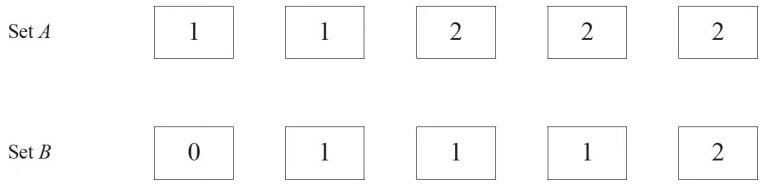
iii)
Write down the number of black counters in the bag.

[1]

[8 marks]

Question 4a

The diagram shows two sets of cards.



i)
Jojo chooses two cards at random from Set *A* without replacement.

Find the probability that the two cards have the same number.

[3]

ii)
Jojo replaces the two cards.
Kylie then chooses one card at random from Set *A* and one card at random from Set *B*.

Find the probability that the two cards have the same number.

[3]

iii)
Who is the most likely to choose two cards that have the same number?
Show all your working.

[1]

[7 marks]

Question 4b

Set C	4	4	5	5	5

Lena chooses three cards at random from Set C without replacement.

Find the probability that the third card chosen is numbered 4.

[3]

[3 marks]

Question 5

Suleika has six cards numbered 1 to 6.

1	2	3	4	5	6

Suleika takes two cards at random, without replacement.

i)
Find the probability that the sum of the numbers on the two cards is 5.

[3]

ii)
Find the probability that at least one of the numbers on the cards is a square number.

[3]

[6 marks]

Question 6

The diagram shows 5 cards.

Donald chooses two of the five cards at random, without replacement.
He works out the total number of dots on these two cards.

i)
Find the probability that the total number of dots is 5.

[3]

ii)
Find the probability that the total number of dots is an odd number.

[3]

[6 marks]

Question 7

A box contains 20 packets of potato chips.
6 packets contain barbecue flavoured chips.
10 packets contain salt flavoured chips.
4 packets contain chicken flavoured chips.

Maria takes three packets at random, **without replacement**, from the 20 packets.

Find the probability that she takes **at least two** packets of chicken flavoured chips.

[3]

[3 marks]