Mathematics 43601F

Unit 1

Thursday 11 June 2015  1.30 pm to 2.30 pm

For this paper you must have:
- a calculator
- mathematical instruments.

Time allowed
- 1 hour

Instructions
- Use black ink or black ball-point pen. Draw diagrams in pencil.
- Fill in the boxes at the top of this page.
- Answer all questions.
- You must answer the questions in the spaces provided. Do not write outside the box around each page or on blank pages.
- Do all rough work in this book.

Information
- The marks for questions are shown in brackets.
- The maximum mark for this paper is 54.
- The quality of your written communication is specifically assessed in Questions 6, 9 and 13. These questions are indicated with an asterisk (*).
- You may ask for more answer paper and graph paper. These must be tagged securely to this answer book.

Advice
- In all calculations, show clearly how you work out your answer.
A fair spinner has 10 equal sections.

1 (a) Circle the chance of the arrow landing on a shaded section.

impossible unlikely evens likely certain

1 (b) Circle the chance of the arrow landing on a 1

impossible unlikely evens likely certain

1 (c) Circle the chance of the arrow landing on a shaded section with a 2

impossible unlikely evens likely certain

Answer all questions in the spaces provided.
The table shows the number of people in three classes.

<table>
<thead>
<tr>
<th>Number of people</th>
</tr>
</thead>
<tbody>
<tr>
<td>Music</td>
</tr>
<tr>
<td>Dance</td>
</tr>
<tr>
<td>Art</td>
</tr>
</tbody>
</table>

Complete the pictogram to show the information for Dance and Art. Remember to complete the key.

Key:  \( \bigcirc \) represents \( \ldots \ldots \ldots \) people

<p>| | | | | |</p>
<table>
<thead>
<tr>
<th></th>
<th></th>
<th></th>
<th></th>
<th></th>
</tr>
</thead>
<tbody>
<tr>
<td>Music</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Dance</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Art</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>
The bar chart shows the number of children at a club on four days.

Number of children at a club

![Bar chart with days: Monday, Tuesday, Wednesday, Thursday, and Friday, showing frequency of boys and girls.]

3 (a) How many boys went to the club on Tuesday?

[1 mark]

Answer .................................................................

3 (b) On which of the four days did the most children go?
Circle your answer.

[1 mark]

Monday Tuesday Wednesday Thursday

3 (c) On Friday there were

twice as many boys as girls
6 more boys than girls.

Complete the bar chart for Friday.

[2 marks]
Two groups of people, A and B, were asked the same question.

(a) Here are the 16 replies from group A.

Yes  No  Don’t know  Yes
Don’t know  Yes  No  Yes
No  Yes  Yes  No
Yes  Don’t know  Yes  Yes

Complete the table for group A.

<table>
<thead>
<tr>
<th>Reply</th>
<th>Tally</th>
<th>Frequency</th>
</tr>
</thead>
<tbody>
<tr>
<td>Yes</td>
<td></td>
<td></td>
</tr>
<tr>
<td>No</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Don’t know</td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

Total = 16

(b) Group A is one-third the size of group B. Half of group B said Yes.

How many people altogether said Yes?

Answer .........................................................
5 Only cars with two or more people are allowed to use a road lane. 
The diagram shows information about cars using the lane.

5 (a) Work out the total number of cars with 2 or more people. 

............................................................................................................................................

Answer ......................................................................

5 (b) Work out the total amount of the fines for these cars. 

............................................................................................................................................

Answer £ ...................................................................
Adam and Matthew each run five races.

Here are Adam’s times in minutes.

44  50  44  48  43

Matthew has a mean time of 47 minutes.

Who has the lower mean time?
You must show your working.

[3 marks]

Answer .................................................................

Put these probabilities in order starting with the lowest.

0.7  \( \frac{2}{3} \)  66%

[1 mark]

Lowest ........................................

Highest ........................................
People choose **one** sandwich, **one** fruit and **one** drink from this list.

<table>
<thead>
<tr>
<th>Sandwich</th>
<th>Fruit</th>
<th>Drink</th>
</tr>
</thead>
<tbody>
<tr>
<td>Egg (E)</td>
<td>Apple (A)</td>
<td>Cola (C)</td>
</tr>
<tr>
<td>Ham (H)</td>
<td>Banana (B)</td>
<td>Water (W)</td>
</tr>
</tbody>
</table>

8 (a) List all possible choices. One has been done for you.

EAC

[2 marks]

8 (b) What fraction of the choices include an apple?

Answer

[1 mark]
The stem-and-leaf diagram shows the number of hotel guests on 15 nights.

Key: 70 represents 70 guests

```
4 | 8
5 | 6 6 7 9
6 | 0 3 5 7 8 8 9
7 | 0 1 3
```

9 (a) Work out the range.

Answer .................................................................

9 (b) Write down the median.

Answer .................................................................

*9 (c) The hotel owner pays for an advert.
Then he records the number of guests on another 15 nights.

The range is the same.
The median is 68

Did the advert work?
Use the data to support your answer.

Answer .................................................................

Answer .................................................................
Five singers took part in a competition. Viewers voted for their favourite. The table shows the proportion of the votes for four of the singers.

<table>
<thead>
<tr>
<th>Singer</th>
<th>Proportion</th>
</tr>
</thead>
<tbody>
<tr>
<td>Ali</td>
<td>0.56</td>
</tr>
<tr>
<td>Beth</td>
<td>0.19</td>
</tr>
<tr>
<td>Carl</td>
<td>0.14</td>
</tr>
<tr>
<td>Dan</td>
<td>0.08</td>
</tr>
<tr>
<td>Emma</td>
<td></td>
</tr>
</tbody>
</table>

10 (a) Complete the table. [2 marks]

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............................................................................................................................................

10 (b) There were 9.4 million votes. How many votes were for Ali? [2 marks]

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Answer ............................................................................................
The chart shows information about sales of loaves of bread at a bakery.

11 (a) In April, the bakery sold 8200 loaves.

How many of the 8200 loaves were white loaves?

Answer

11 (b) The table shows the sales for May.

<table>
<thead>
<tr>
<th></th>
<th>White</th>
<th>Brown</th>
<th>Granary</th>
<th>Total</th>
</tr>
</thead>
<tbody>
<tr>
<td>April</td>
<td>3000</td>
<td>1800</td>
<td>1200</td>
<td>6000</td>
</tr>
</tbody>
</table>

Show this information on the chart.

Answer
In a survey, 600 people chose A, B, C or D.

120 people chose A.

Number who chose A : Number who chose B = 1 : 3

Number who chose C = Number who chose D

Complete the table.

<table>
<thead>
<tr>
<th></th>
<th>A</th>
<th>B</th>
<th>C</th>
<th>D</th>
</tr>
</thead>
<tbody>
<tr>
<td>Number of people</td>
<td>120</td>
<td></td>
<td></td>
<td>Total = 600</td>
</tr>
</tbody>
</table>
A professor wants to know whether boys or girls are more likely to study Economics.

**13 (a)** Write a suitable hypothesis. [1 mark]

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13 (b) He asks some boys and girls if they plan to study Economics.

Design a data collection sheet for his results. [2 marks]

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Turn over for the next question
14 The scatter graph shows information about the marks of 10 students in two tests.

14 (a) Describe the correlation.  

[1 mark]

Answer ......................................................................

14 (b) A student scored 40 in the first test.  

Estimate her total for both tests.  

[2 marks]

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..........................................................................

Answer ......................................................................
A pet shop had 40 rabbits.
22 were male.
The others were female.

The shop sold 10 of the rabbits.

The probability that a rabbit picked at random is male is now \( \frac{1}{2} \).

How many \textbf{female} rabbits were sold?

[3 marks]

Answer .................................................................

Turn over for the next question
A machine makes buttons. The graph shows the relative frequency of buttons that are faulty.

16 (a) 18 of the first 100 buttons are faulty.

Plot the relative frequency on the graph. [1 mark]

16 (b) One week the machine makes 5000 buttons.

Work out the best estimate of the number of faulty buttons. Use the graph to help you. [2 marks]

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Answer .............................................................................

END OF QUESTIONS