



General Certificate of Secondary Education

Centre Number

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Candidate Number

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# Statistics

Unit 2  
Foundation Tier



**ML**

## [GST21] Assessment

### TIME

1 hour 30 minutes, plus your additional time allowance.

### Assessment Level of Control:

Tick the relevant box (✓)

Controlled Conditions	
Other	

### INSTRUCTIONS TO CANDIDATES

Write your Centre Number and Candidate Number in the spaces provided at the top of this page.

Write your answers in the spaces provided in this question paper.

Answer **all nine** questions.

Any working should be clearly shown in the spaces provided since marks may be awarded for partially correct solutions.

You **may** use a calculator for this paper.

### INFORMATION FOR CANDIDATES

The total mark for this paper is 80.

Figures in brackets printed down the right-hand side of pages indicate the marks awarded to each question or part question.

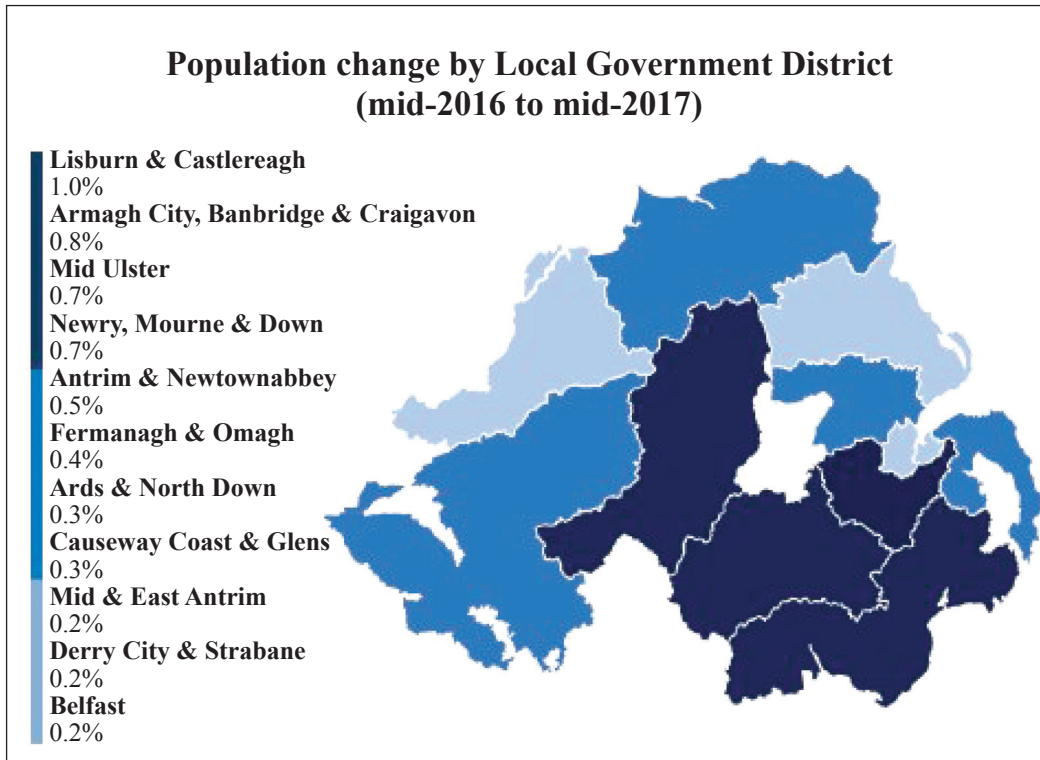
You should have a calculator, ruler, compasses and protractor.

There is no formula sheet for this examination.

For Examiner's use only	
Question Number	Marks
1	
2	
3	
4	
5	
6	
7	
8	
9	
<b>Total Marks</b>	

Examiner Only	
Marks	Remark

- 1 The chart below shows the change in the population of Northern Ireland by Local Government District between mid-2016 and mid-2017



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- (a) What is the name of this type of chart?

Choropleth map  Compound bar chart  [1]

- (b) What was the percentage change in the population of Mid Ulster between mid-2016 and mid-2017?

Answer \_\_\_\_\_% [1]

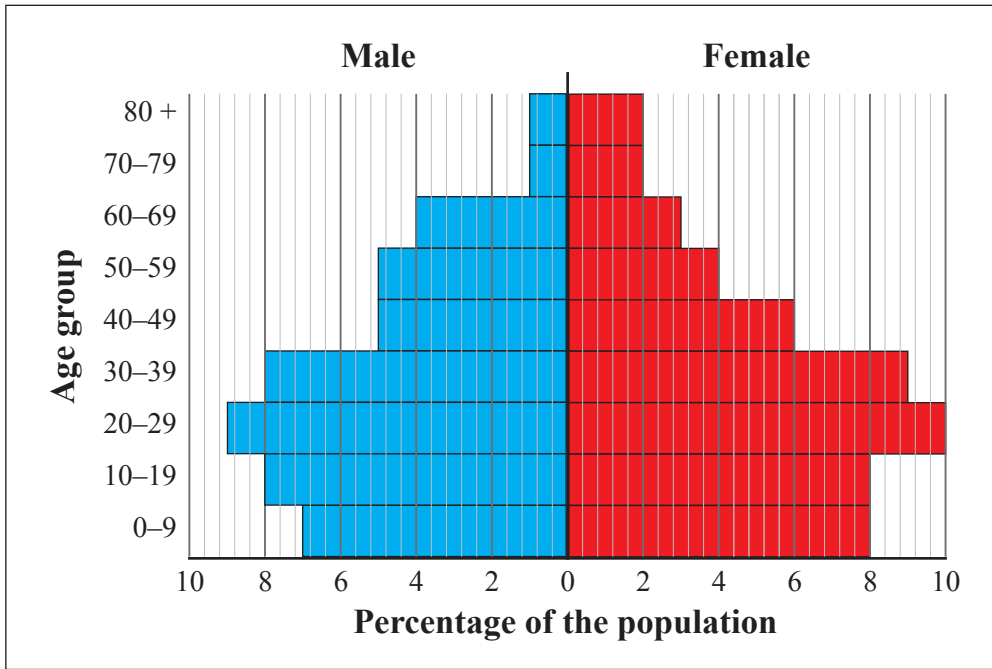
- (c) In which Local Government District did the population change by the largest percentage?

\_\_\_\_\_ [1]



2 The population pyramid shows the age and gender distribution in a large town.

Examiner Only	
Marks	Remark



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(a) What percentage of the population are males aged between 20 and 29?

Answer \_\_\_\_\_% [1]

(b) In which age group is the percentage the same for both genders?

Answer \_\_\_\_\_ [1]

Jonathan says, “The population pyramid shows there are more females than males living in the town.”

(c) (i) Is Jonathan correct?

Yes  No  Cannot say  [1]

(ii) Explain your answer.

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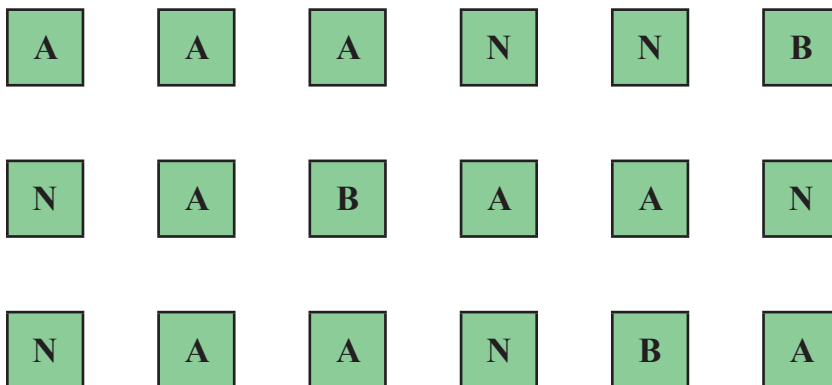
[2]

3 A box contains six cards with letters written on them.

The cards spell out a six letter word.

In a game, players try to guess the word. They pick out a card, note the letter and put the card back in the box.

After 18 goes, Sean has noted the following letters:



(a) Use the table below to summarise Sean’s results.

Letter	Frequency	Fraction of cards
A		
B		
N		

[3]

Sean says, “The cards in the box spell the word BANANA.”

(b) Do you think Sean is correct?

Give a reason for your answer.

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[2]

Examiner Only	
Marks	Remark

4 The manager of a shoe shop wants to make better decisions about the shoes she orders for her shop.

She records the shoe sizes of a sample of 20 boys and 20 girls who visit her shop.

The results are given below.

(boy, 3) (boy, 4) (girl, 3) (girl, 4) (boy, 2) (boy, 4) (girl, 3) (girl, 4)  
 (girl, 3) (boy, 4) (girl, 4) (boy, 3) (girl, 4) (boy, 3) (boy, 5) (boy, 4)  
 (girl, 4) (boy, 4) (girl, 3) (boy, 4) (boy, 5) (boy, 4) (girl, 4) (boy, 2)  
 (boy, 5) (girl, 3) (boy, 2) (girl, 3) (girl, 2) (boy, 5) (boy, 4) (girl, 3)  
 (girl, 4) (girl, 3) (girl, 5) (boy, 3) (boy, 3) (girl, 3) (girl, 3) (girl, 2)

(a) Tick one box in each row to identify the type of variable.

	Categorical	Continuous	Discrete
Shoe size			
Gender			

[2]

(b) Has the manager collected primary data or secondary data?

Primary data  Secondary data  [1]

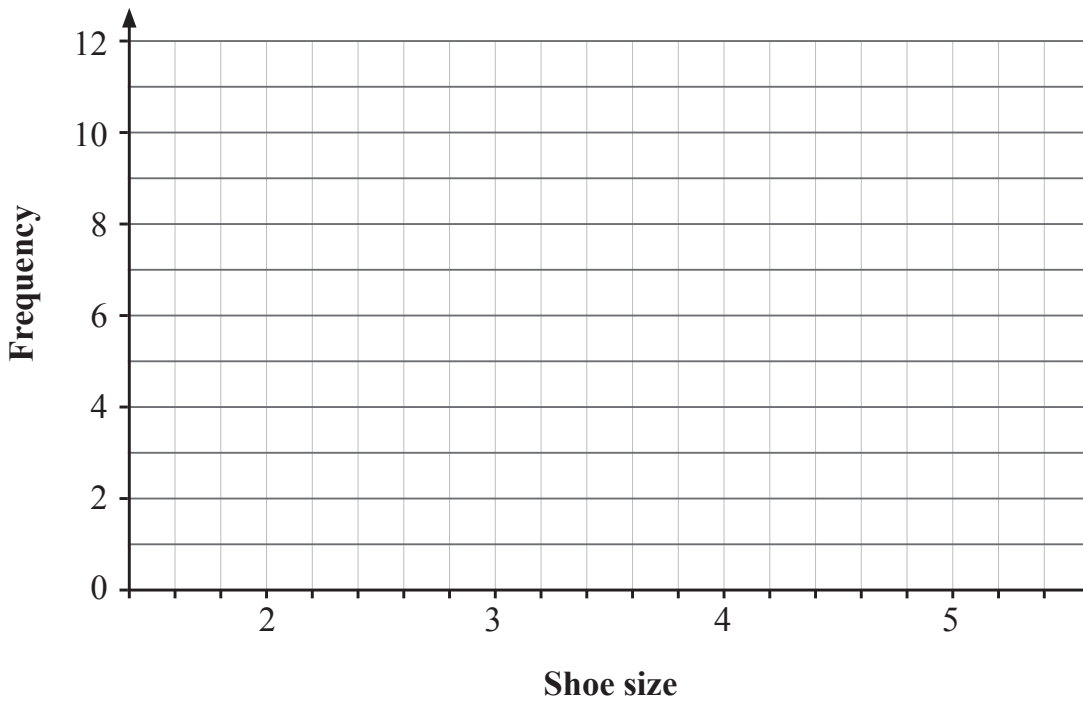
(c) Complete the Tally and Frequency columns in the table below.

Shoe size	Boys		Girls	
	Tally	Frequency	Tally	Frequency
2				
3				
4				
5				

[4]

(d) On the grid below, draw a dual bar chart to represent the data collected by the manager.

Examiner Only	
Marks	Remark



**KEY:**



**Boys**



**Girls**

[4]

5 Anna records the amount of money she spends on lunch over 10 days.

Her results are as follows.

£3.95 £3.50 £2.85 £2.40 £3.10 £2.75 £3.30 £3.70 £3.00 £3.75

(a) Find the median amount of money spent by Anna over the 10 days.

Answer £ \_\_\_\_\_ [3]

(b) Why is it not possible to find the modal amount of money spent by Anna?

\_\_\_\_\_  
\_\_\_\_\_  
\_\_\_\_\_ [1]

(c) Calculate the range of the amounts of money spent by Anna.

Answer £ \_\_\_\_\_ [2]

Examiner Only	
Marks	Remark





6 Conor carried out a survey in his class about the types of chocolate his friends like.

Here is Conor's data collection sheet.

<b>Pupil</b>	<b>Do you like milk chocolate?</b>	<b>Do you like dark chocolate?</b>
1	Yes	Yes
2	Yes	Yes
3	Yes	Yes
4	Yes	Yes
5	Yes	No
6	Yes	No
7	No	No
8	No	No
9	Yes	No
10	Yes	Yes
11	Yes	Yes
12	Yes	No
13	Yes	Yes
14	Yes	Yes
15	Yes	Yes
16	Yes	No
17	No	No
18	Yes	Yes
19	Yes	Yes
20	Yes	Yes
21	No	Yes
22	Yes	Yes
23	Yes	Yes
24	Yes	Yes
25	No	Yes
26	Yes	Yes
27	Yes	Yes
28	Yes	Yes
29	Yes	Yes
30	No	No



7 Alex is the manager of a doctors' surgery.

He is concerned about the number of missed appointments.

Alex recorded the number of missed appointments each month for 20 months.

The results are given below.

31	4	19	0	5
25	10	2	16	24
17	22	173	21	13
20	18	3	11	26

One of the results is an outlier.

(a) Which one of the results is this?

Answer \_\_\_\_\_ [1]

The outlier is removed.

(b) With the outlier removed, draw a stem and leaf diagram to illustrate the data.



[3]

Examiner Only	
Marks	Remark



After some time, Alex extended his investigation by conducting a survey about the app with patients who came to the surgery.

One of the questions in the questionnaire was:

<i>How many times have you used our new app?</i>			
<b>1–2</b>	<input type="checkbox"/>	<b>3–4</b>	<input type="checkbox"/>
<b>4–5</b>	<input type="checkbox"/>	<b>More than 5</b>	<input type="checkbox"/>

(e) Write down two problems with the response section.

1. \_\_\_\_\_ [1]

2. \_\_\_\_\_ [1]

(f) Suggest one improvement Alex could make to his investigation.

\_\_\_\_\_  
\_\_\_\_\_  
\_\_\_\_\_ [1]

Examiner Only	
Marks	Remark

**8** Maria is investigating how the age and gender distribution of the population of Northern Ireland has changed between June 2008 and June 2018

She intends to use the statistical enquiry cycle to carry out her investigation.

**(a)** Write down a suitable question which Maria could use for her investigation.

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[1]

**(b)** What data would Maria need to collect?

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[3]

**(c)** Suggest a suitable source for Maria's data.

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[1]

**(d)** How could Maria present her results in diagrammatic form?

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[2]

**(e)** Suggest a suitable calculation which Maria could use and how she could interpret the result.

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[3]

Examiner Only	
Marks	Remark

- 9 The table below shows the annual population estimates by age group in Northern Ireland between mid-2001 and mid-2017

**Annual population estimates by broad age groups,  
Northern Ireland (mid-2001 to mid-2017)**

Mid-Year Ending	Age groups					As a proportion of all ages			
	All ages	0–15	16–64	65+	85+	0–15	16–64	65+	85+
2001	1 688 800	397 500	1 067 200	224 100	23 500	23.5	63.2	13.3	1.4
2002	1 697 500	391 700	1 079 000	226 800	23 700	23.1	63.6	13.4	1.4
2003	1 704 900	385 900	1 089 700	229 400	23 800	22.6	63.9	13.5	1.4
2004	1 714 000	381 200	1 100 600	232 200	24 400	22.2	64.2	13.5	1.4
2005	1 727 700	378 800	1 114 100	234 900	25 900	21.9	64.5	13.6	1.5
2006	1 743 100	377 100	1 127 900	238 100	27 000	21.6	64.7	13.7	1.6
2007	1 761 700	377 100	1 142 700	241 900	27 900	21.4	64.9	13.7	1.6
2008	1 779 200	378 500	1 153 200	247 500	28 900	21.3	64.8	13.9	1.6
2009	1 793 300	379 500	1 160 400	253 400	29 700	21.2	64.7	14.1	1.7
2010	1 804 800	380 000	1 165 200	259 600	30 800	21.1	64.6	14.4	1.7
2011	1 814 300	380 800	1 167 800	265 800	31 800	21.0	64.4	14.6	1.8
2012	1 823 600	382 100	1 168 700	272 800	32 700	21.0	64.1	15.0	1.8
2013	1 829 700	382 600	1 168 000	279 100	33 300	20.9	63.8	15.3	1.8
2014	1 840 500	383 800	1 170 800	285 900	34 400	20.9	63.6	15.5	1.9
2015	1 851 600	385 200	1 174 600	291 800	35 500	20.8	63.4	15.8	1.9
2016	1 862 100	388 000	1 176 400	297 800	36 500	20.8	63.2	16.0	2.0
2017	1 870 800	390 700	1 177 200	303 000	37 200	20.9	62.9	16.2	2.0

- (a) What was the estimated total population in mid-2004?

Answer \_\_\_\_\_ million people [1]

- (b) Does the information in the table suggest that the population is continuing to age? Explain your answer.

\_\_\_\_\_

\_\_\_\_\_

\_\_\_\_\_

[2]

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Marks	Remark



Teresa thinks that the totals for all ages in the table have been calculated incorrectly. She says, “In 2001 the total population has been stated as 1 688 800 but the age group totals add up to 1 712 300.”

Examiner Only	
Marks	Remark

(c) Explain whether or not Teresa is correct.

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[3]

Teresa wishes to analyse the trend in estimated total population in Northern Ireland between mid-2001 and mid-2017

(d) Write down the name of one diagram Teresa could use to illustrate this trend.

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[1]

Teresa decides to use simple index numbers to analyse the trend in estimated total population in Northern Ireland between mid-2001 and mid-2017

She uses mid-2001 as the base period.

(e) Write down the index number for mid-2001

Answer \_\_\_\_\_ [1]

Teresa calculates the simple index number for mid-2017 to be 110.8

(f) Use this information to complete the sentence below.

The population in \_\_\_\_\_ is \_\_\_\_\_ %  
 more than it was in \_\_\_\_\_ . [3]

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**THIS IS THE END OF THE QUESTION PAPER**

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