Centre Number						Candidate Number				
Surname										
Other Names										
Candidate Signature										

For Examiner's Use	
Examiner's Initials	
Question	Mark
1	
2	
3	
4	
5	
6	
7	
8	
9	
10	
11	
TOTAL	

General Certificate of Secondary Education
Foundation Tier
Specimen Paper

Statistics

XXXX/F

Date: Time

F

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

Time allowed
- 1 hour 30 minutes.

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. Answers written in margins will not be marked.
- Use a calculator where appropriate.
- Do all rough work in this book.

Information
- The maximum mark for this paper is 80.
- The marks for questions are shown in brackets.
- 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.

Answer **all** questions in the spaces provided

1 Stephen works in a newsagent's on a Saturday morning.
He records the number of items bought by each customer.
The results for last Saturday were as follows.

Number of items bought by each customer	Tally	Frequency
1	𝍸 𝍸 𝍸 𝍸 |||	
2	𝍸 𝍸 𝍸 𝍸 𝍸 |||	
3	𝍸 𝍸 𝍸 |||	
4	𝍸 |	
5	|||	
6	||	

(a) Complete the frequency column.

(2 marks)

(b) How many customers were there?

Answer .....

(2 marks)

(c) What was the total number of items bought?

.....

.....

.....

Answer .....

(3 marks)

(d) Calculate the mean number of items bought by each customers.

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.....

.....

.....

Answer.....

(2 marks)

(e) (i) What was the modal number of items bought by each customer?

Answer.....

(1 mark)

(e) (ii) Explain, in the context of this question, what the modal number of items bought by each customer means.

.....

.....

(1 mark)

2 A store sells football shirts in five colours: red, blue, green, yellow and white.

The pictogram shows the number of shirts of each colour sold last month.

Red	
Blue	
Green	
Yellow	
White	

 represents 10 shirts

(a) What colour of shirt is least popular?

Answer .....

(1 mark)

(b) How many shirts in total were sold last month?

.....

.....

.....

Answer .....

(2 marks)

(c) How many more red shirts were sold than white shirts?

.....

.....

Answer .....

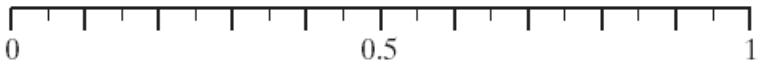
(2 marks)

(d) Using the information in the pictogram, mark on the line below

Barcode

(i) with a letter 'G' an estimate of the probability that the next shirt sold will be green

(ii) with a letter 'B' an estimate of the probability that the next shirt sold will be blue



(2 marks)

(e) Use the information in the pictogram to find an estimate of the probability that the next shirt to be sold will be

(i) black

.....

.....

Answer.....

(1 mark)

(ii) not red

.....

.....

(2 marks)

3 The table below gives the results of a survey carried out on a housing estate.

		Number of adults in household				
		1	2	3	4	Total
Number of children in household	0	90	125	31	9	255
	1	9	40	15	6	70
	2	20	22	10	4	56
	3	12	7	4	0	23
	4	8	0	1	0	9
	Total	139	194	61	19	

For example, 40 households have 2 adults and 1 child.

(a) How many households

(i) have 3 adults and 2 children?

Answer .....

(1 mark)

(ii) have 2 adults?

Answer .....

(1 mark)

(iii) took part in the survey?

.....

Answer .....

(2 marks)

(b) The table contains the entry 15.
Explain what this entry means in the context of this table.

.....

(1 mark)

(c) For this survey what is the greatest number of people in a household?

.....

Answer .....

(2 marks)

Barcode

LEAVE MARGIN BLANK

4 The list gives the surnames of the 28 families living in a street.

01	Anderson	15	Joab
02	Bailey	16	Lovejoy
03	Brown	17	McKinney
04	Brownley	18	Morgan
05	Cadman	19	North
06	Cargill	20	Patel
07	Crowther	21	Paybet
08	Fenton	22	Randall
09	Fernandez	23	Shah
10	Garland	24	Singh
11	Grinling	25	Taylor
12	Halliday	26	Thorns
13	Holding	27	Wong
14	Imeson	28	Woodcock

Obtain a random sample of five different families using pairs of digits selected from the following list starting at 23.

23 39 20 09 18 23 00 14 83 75 36 62 92 01 21 33 15 22 09 08 68 27

.....

.....

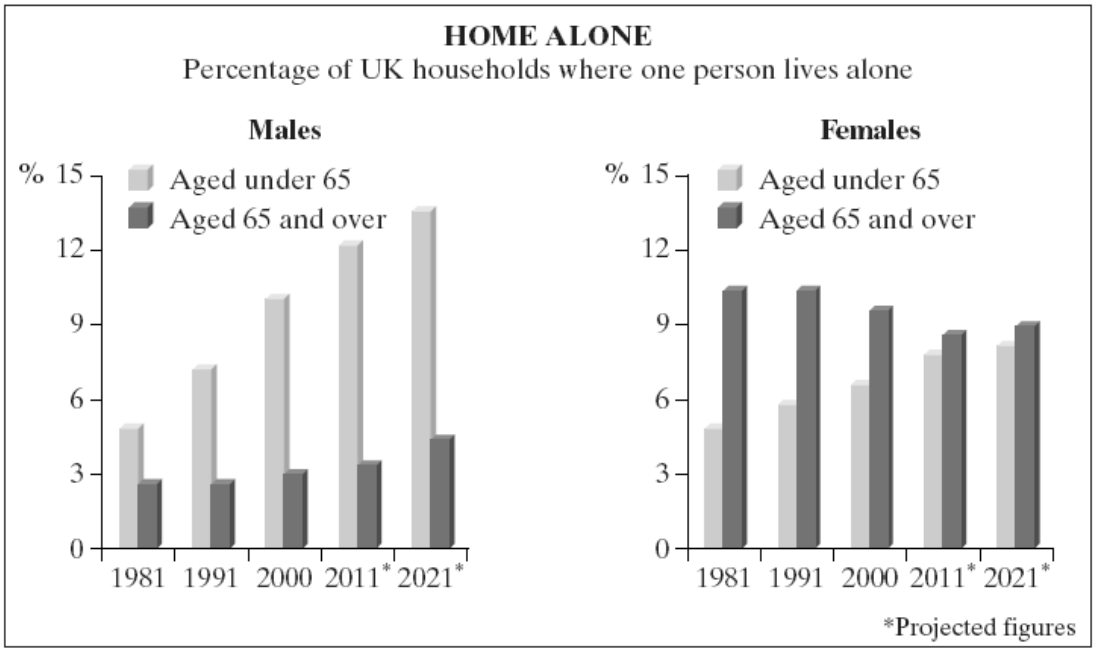
.....

Family Number	Name

(4 marks)


Barcode

5 The diagrams show the percentage of UK households where one person lives alone.



Source: adapted from *Social Trends*

(a) Give **one** criticism of these diagrams.

.....

.....

.....

(1 mark)

(b) What is the projected percentage of males aged under 65 who will be living alone in the UK in 2011?

.....

Answer .....

(1 mark)

(b) Which year has the largest difference between the percentage of females aged under 65 and those aged 65 and over living alone?

.....

Answer .....

(1 mark)

Barcode

LEAVE MARGIN BLANK

(c) The diagrams have been based on information obtained from the National Census. Give **one** difference between a census and a sample.

.....

Answer .....

(1 mark)

6 Rodney is considering opening a small restaurant in the village where he lives.

To find out the views of local people he delivers a questionnaire to every house in the village.

(a) Included in the questionnaire is a closed question asking for people's age.

(i) Explain what is meant by a *closed question*.

.....

.....

(1 mark)

(ii) Give one advantage of using a closed question for age.

.....

.....

(1 mark)

(b) Only 12% of the questionnaires are returned to Rodney.

How might Rodney have improved the response rate?

.....

.....

(1 mark)

(c) One of Rodney's questions was

"How often do you eat out at a pub or restaurant?"

Give two criticisms of this question.

Criticism 1 .....

.....

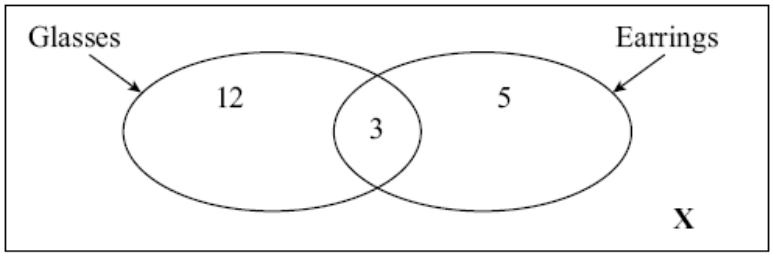
(1 mark)

Criticism 2 .....

.....

(1 mark)

7 A survey of 24 students was carried out about the number of students who wear glasses and wear earrings.
The diagram shows some of the information from this survey



The section labelled **X** has not been completed.

(a) Work out the number that should go in the section labelled **X**.

.....

.....

Answer .....

(2 marks)

(b) What can you say about the students in the section labelled **X**?

.....

.....

(1 mark)

LEAVE MARGIN BLANK

(c) One student is chosen at random
What is the probability that the student

(i) wears earrings, but does not wear glasses

Answer.....
(1 mark)

(ii) wears earrings and wears glasses

Answer.....
(1 mark)

(d) A student chosen at random wears earrings. What is the probability that this student also wears glasses?

.....

.....

Answer.....
(2 marks)

8 Adam and Mary are investigating whether behaviour in classes of primary school children is affected by the seating design of the classroom.
They investigate the hypothesis that behaviour is better if children are seated in rows.

They each watch different lessons where classes are seated either in rows or in groups.

(a) Name this data collection method.

Answer.....
(1 mark)

(b) Write down **two** extraneous variables which could affect the results of the investigation.

Variable 1 .....

Variable 2 .....
(2 marks)

(c) (i) Explain the meaning of the term 'inter-observer' bias.

.....

.....

(1 mark)

(ii) Give **two** ways inter-observer bias might be minimised in this investigation

First way .....

.....

Second way.....

.....

(2 marks)

9 As part of a school project, Paul carried out 2 surveys of the ages of passengers using his local train service.
The surveys were undertaken at 10 am and 5 pm on a Tuesday.
There were 100 passengers in each survey.

The results for the 10 am survey were as follows.

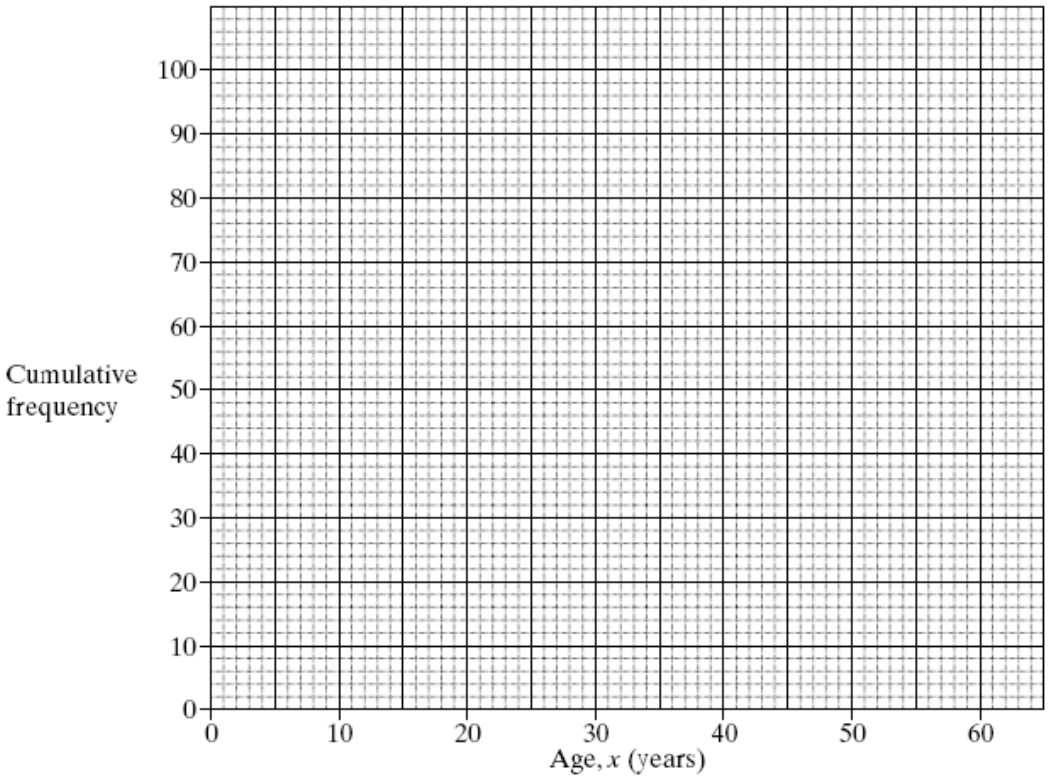
Age, x (years)	**Frequency**	**Cumulative Frequency**
$0 \leqslant x < 10$	14	14
$10 \leqslant x < 20$	41	
$20 \leqslant x < 30$	13	
$30 \leqslant x < 40$	19	
$40 \leqslant x < 50$	9	
$50 \leqslant x < 60$	4	

(a) Complete the cumulative frequency column.

(2 marks)

LEAVE MARGIN BLANK

(b)Draw a cumulative frequency polygon on the grid below.



(3 marks)

(c) Use your diagram to estimate

(i) the median

Answer.....

(1 mark)

(ii) the lower quartile

Answer.....

(1 mark)

(iii) the upper quartile

Answer.....

(1 mark)

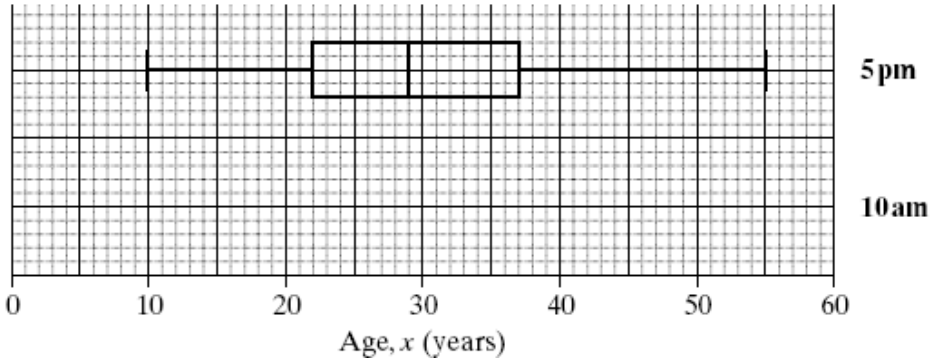
(d) The youngest passenger was 3 years old.
The oldest passenger was 57 years old

Find the range.

Answer .....

(1 mark)

(e) Paul drew a box and whisker plot for the 5 pm survey.



(i) Draw a box and whisker plot for the 10 am survey.

(4 marks)

(ii) Write down **two** differences between the ages of passengers in the two surveys.

Difference 1 .....

.....

Difference 2 .....

.....

(2 marks)

LEAVE MARGIN BLANK

10 The table shows the cost indices for renting a shop, using 1997 as the base year.

Year	1997	1998	1999	2000	2001	2002
Cost Index	100	115	96	118	110	113

(a) In which years did the rent fall?

Answer.....

(2 marks)

(b) The annual rent was £6000 in 1997.

Calculate the annual rent in 1998.

.....

.....

.....

Answer £.....

(2 marks)

(c) In which year was the annual rent the highest?

Answer.....

(1 mark)

11 The Headteacher of a school thought that fewer pupils stayed for school lunches than the previous year.

He decided that a survey of the eating habits of the school should be carried out.

(a) Specify a hypothesis that could be tested to see if the Headteacher was correct.

.....

.....

(1 mark)

(b) Give **one** reason why it might be useful to undertake a pilot survey.

.....

.....

(1 mark)

(c) Give **one** reason why each of the following methods would **not** give random results.

(i) Standing outside the school canteen on a Monday lunchtime questioning pupils as they arrive.

.....

.....

.....

(1 mark)

(ii) Sending a questionnaire to every pupil on the school register whose surname begins with S.

.....

.....

.....

(1 mark)

Barcode

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(d) The school canteen keeps a daily record of its customers.

State whether each of the following variables is qualitative, discrete or continuous.

(i) The number of pupils served.

Answer.....

(1 mark)

(ii) The age of the pupils served.

Answer.....

(1 mark)

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