Paper Reference 1ST0/1F
Pearson Edexcel
Level 1/Level 2 GCSE (9–1)

Total Marks

Statistics
Paper 1
(Calculator)
Foundation Tier

Thursday 13 June 2019 – Afternoon

Time: 1 hour 30 minutes plus your additional time allowance.

In the boxes below, write your name, centre number and candidate number.

Surname						
Other names						
Centre Number						
Candidate Number						

V60680A

Pearson

YOU MUST HAVE

Ruler, protractor, compasses, writing and drawing equipment, scientific calculator.

YOU WILL BE GIVEN

Data Book

INSTRUCTIONS

Answer ALL questions.

Answer the questions in the spaces provided in this Question Paper or on the separate data sheets – there may be more space than you need.

Scientific calculators may be used.

You must show all your working out with your answer clearly identified at the end of your solution.

INFORMATION

The total mark for this paper is 80

The marks for EACH question are shown in brackets – use this as a guide as to how much time to spend on each question.

There may be spare copies of some data sheets.

ADVICE

Read each question carefully before you start to answer it.

Try to answer every question.

Check your answers if you have time at the end.

Answer ALL questions.

Write your answers in the spaces provided.

You must write down all the stages in your working.

1. A bag contains 8 coloured beads.

There are

4 blue beads,

2 red beads,

1 green bead,

1 yellow bead.

A bead is picked at random from the bag.

(continued on the next page)

1. continued.

(a) Look at the diagram for Question 1(a) in the Data Book. Underline the word from the list of five that best describes the likelihood that the bead is green. (1 mark)

(b) Beads of which two colours are equally likely to be picked? (1 mark)

_____ and _____

(continued on the next page)

1. continued.

(c) Look at the diagram for Question 1(c) in the Data Book. On the probability scale, mark the probability that the bead is blue.

(1 mark)

(d) Look at the diagram for Question 1(d) in the Data Book. On the probability scale, mark the probability that the bead is black.

(1 mark)

(Total for Question 1 is 4 marks)

2. Look at the diagram for Question 2 in the Data Book.

It shows an incomplete bar chart.

Andrew has collected data about the ratings given to a particular television by 20 people.

Each person has given the television a rating from 1–star to 5–star.

The lowest rating is 1–star and the highest rating is 5–star.

(continued on the next page)

2. continued.

The incomplete bar chart gives the number of 1–star ratings, of 2–star ratings, of 3–star ratings and of 5–star ratings.

3 people gave the television a 4–star rating.

(a) Complete the bar chart.

(1 mark)

(continued on the next page)

2. continued.

More people gave the television a 1–star rating than a 3–star rating.

(b) How many more?

(1 mark)

(continued on the next page)

2. continued.

Andrew thinks that the bar chart shows that this is a good television to buy as most people gave it a 5–star rating.

(c) Explain why Andrew might NOT be right.

(1 mark)

(Total for Question 2 is 3 marks)

3. Lena is researching information about the numbers of British Oscar winners.

Here are her results, giving the number of British Oscar winners for each of the years 1981 to 2010

7	10	1	5	4	11	5	3
8	3	3	4	3	4	5	4
3	9	7	6	4	4	3	2
4	1	6	6	2	4		

(Source: www.theguardian.com)

(continued on the next page)

3. continued.

Lena found the data in a newspaper.

(a) Correctly complete the following sentence.

Because Lena found the data in a newspaper, the data is

_____ data.

(1 mark)

(continued on the next page)

3. continued.

(b) Look at the table for Question 3(b) in the Data Book.

Fill in the tally chart for Lena's results AND complete the frequency column.

(2 marks)

(c) Write down the modal group.

(1 mark)

(continued on the next page)

3. continued.

(d) Work out the total number of years between 1981 and 2010 for which there were fewer than 7 British Oscar winners.

(2 marks)

(continued on the next page)

3. continued.

(e) Suggest a suitable diagram that could be used for Lena's results.

(1 mark)

(Total for Question 3 is 7 marks)

4. Look at the information for Question 4 in the Data Book.

It shows the weights, in kilograms, of 10 dogs.

(a) Work out the range.

(2 marks)

_____ kg

(continued on the next page)

4. continued.

(b) Work out the median.

(2 marks)

_____ kg

(continued on the next page)

4. continued.

The median is more appropriate than the mean to summarise the data.

(c) Explain why.

(1 mark)

_____

_____

_____

(Total for Question 4 is 5 marks)

5. Jane collected data about the earnings of the 10 highest earning male tennis players and the 10 highest earning female tennis players.

Jane plans to use a scatter diagram to compare the earnings of the male tennis players with the earnings of the female tennis players.

(continued on the next page)

5. continued.

(a) Discuss whether or not a scatter diagram would be a suitable diagram to use.

(2 marks)

(continued on the next page)

5. continued.

Jane collected her data from the internet.

(b) Suggest a possible reason why it might NOT be possible to collect primary data in this case.

(1 mark)

(Total for Question 5 is 3 marks)

6. Inez is going to open a takeaway restaurant in her town.

She asks **100** people,

"What is your favourite type of takeaway?"

(continued on the next page)

6. continued.

(a) Design a data collection sheet for Inez to record the answers to her question.

(2 marks)

(continued on the next page)

6. continued.

Look at the diagram for Question 6(b) in the Data Book.

It shows two pie charts.

Joe runs an Italian restaurant in a different town.

Each pie chart shows information about the type of main meal ordered by customers one evening in Joe's restaurant.

(continued on the next page)

6. continued.

(b) Write down the most popular type of main meal ordered by female customers that evening. (1 mark)

(continued on the next page)

6. continued.

For male customers, one type of main meal was ordered half as many times as pizza.

(c) Write down this type of main meal.

(1 mark)

(continued on the next page)

6. continued.

Hannah says that the number of male customers who ordered meat was the same as the number of female customers who ordered meat.

(d) Explain whether or not the information given in the two pie charts can be used to support this claim.

(2 marks)

Answer lines continue on the next page.

6. (d) continued.

(Total for Question 6 is 6 marks)

7. Mike owns a shop.

He wants to collect information about the types of games liked by people in his town.

The following list gives the information he is going to collect about people's favourite board games.

type of game

average playing time

minimum number of players

(continued on the next page)

7. continued.

(a) From this list, write down the information that is

(i) categorical data,

(1 mark)

(ii) discrete data.

(1 mark)

(continued on the next page)

7. continued.

Mike is planning to send a questionnaire to some of his customers.

He wants to select the customers by using systematic sampling.

Mike has a list of all of his 200 customers.

(b) Explain how Mike can select a systematic sample of 20 people from his list of customers.

(2 marks)

Answer lines are on the next page.

7. (b) continued.

(Total for Question 7 is 4 marks)

8. Suresh is a secondary school student.

He wants to find out how many days off school each teacher has had in the last year.

Suresh plans to find out this information by using his school's employee records.

(continued on the next page)

8. continued.

(a) Give one potential problem with Suresh's data collection plan.

(1 mark)

(continued on the next page)

8. continued.

Look at the table for Question 8(b) in the Data Book.

Ami and Tia work in a primary school.

Ami and Tia are investigating the numbers of days that people working for their school have been absent due to illness.

The table gives information about the number of days that each of 30 people working for the primary school have been absent due to illness in the last year.

(continued on the next page)

8. continued.

Ami and Tia want to work out the average number of days absent due to illness.

Their methods are shown below the table in the Data Book.

(continued on the next page)

8. continued.

(b) Which of these two methods is correct, Ami's or Tia's?

You must give a reason for your answer.

(2 marks)

(continued on the next page)

8. continued.

(c) Find the median number of days absent due to illness.

(2 marks)

(Total for Question 8 is 5 marks)

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9. Look at the diagram for Question 9 in the Data Book.

It shows a scatter diagram.

Naomi recorded the weight, in thousands of tons, and the maximum number of passengers, in hundreds, for 10 cruise ships.

Naomi drew the scatter diagram in the Data Book for her results.

(continued on the next page)

9. continued.

One of the 10 cruise ships has a weight of 116 000 tons.

(a) For this ship, write down its maximum number of passengers.

(1 mark)

_____ hundred

(b) Draw a line of best fit on the scatter diagram.

(1 mark)

(continued on the next page)

9. continued.

(c) Describe and interpret the type of correlation shown by the scatter diagram.

(3 marks)

(continued on the next page)

9. continued.

A new cruise ship is being built.

The ship will have a weight of **170 000** tons.

Naomi plans to use the line of best fit on her scatter diagram to predict the maximum number of passengers for the new cruise ship.

(continued on the next page)

9. continued.

(d) Explain whether or not it is appropriate to use the line of best fit to make her prediction.

(2 marks)

(Total for Question 9 is 7 marks)

10. Look at the diagram for Question 10 in the Data Book.

The percentage composite bar chart shows information about the ages of the listeners to a radio station in the UK in 2002 and in 2016

(a) Find the percentage of the listeners in 2016 who are aged 21–29

(2 marks)

_____%

(continued on the next page)

10. continued.

Martha says that the percentage composite bar charts show that there were less listeners aged 30–49 in 2002 than in 2016

Martha's conclusion may NOT be correct.

(continued on the next page)

10. continued.

(b) Explain why.

(1 mark)

(Total for Question 10 is 3 marks)

11. Look at the diagram for Question 11 in the Data Book.

It shows an incomplete choropleth map.

The diagram on the next page represents a children's playground that has been divided into 20 squares of equal area.

In the playground there are some children and some play equipment only.

(continued on the next page)

11. continued.

The number of children in each square at 11 am one Saturday is shown below.

Key:

9	means 9 children in this square.

Number of children

11	10	7	5	0
9	7	6	3	1
8	4	3	1	1
5	4	2	0	1

(continued on the next page)

11. continued.

(a) Use the information on the previous page to complete the choropleth map in the Data Book. There are eight spaces to fill. (2 marks)

Grace concludes that there is likely to be more play equipment in that part of the playground represented by the squares in the top left hand corner of the choropleth map than elsewhere in the playground.

(continued on the next page)

11. continued.

(b) Assess the validity of Grace's conclusion with reference to the choropleth map.

(1 mark)

(Total for Question 11 is 3 marks)

12. Look at the diagram for Question 12 in the Data Book.

The cumulative frequency diagram gives information about the heights, in metres, of a sample of 100 oak trees in Camden, London.

(a) Using the cumulative frequency diagram, complete the table below for the heights of these 100 trees.

Lower quartile	Median	Upper quartile

(2 marks)

(continued on the next page)

12. continued.

Look at the diagram for Question 12(b) in the Data Book.

The box plot shows information about the heights, in metres, of a sample of maple trees in Camden, London.

For the sample of oak trees

the least height is 2·5 metres

the greatest height is 22·5 metres

(b) On the grid, draw a box plot for the heights of the sample of oak trees.

(2 marks)

(continued on the next page)

12. continued.

(c) Compare the two distributions of heights.

Give THREE comparisons and interpret one of these comparisons.

(4 marks)

Answer lines continue on the next page.

12. (c) continued.

(Total for Question 12 is 8 marks)

13. Look at the table for Question 13 in the Data Book.

It gives information about the numbers of students from different types of schools who applied to Cambridge University in 2016

Richard is going to take a sample of 200 of these students stratified by gender.

(continued on the next page)

13. continued.

(a) Work out how many female students there should be in this sample.

(2 marks)

(continued on the next page)

13. continued.

(b) Describe a situation when it would NOT be appropriate to take a sample stratified by gender.

(1 mark)

(continued on the next page)

13. continued.

Richard could have used a different category for his stratified sample.

(c) What is this different category?

(1 mark)

_____

_____

(continued on the next page)

13. continued.

A student is to be chosen at random from the 9963 students.

F is the event that the student chosen is female.

I is the event that the student chosen is from an independent school.

M is the event that the student chosen is from a maintained school.

(continued on the next page)

13. continued.

(d) Explain why the event F and the event I are NOT mutually exclusive.

(1 mark)

(continued on the next page)

13. continued.

(e) Find P(I or M)

(2 marks)

(Total for Question 13 is 7 marks)

14. Diana is a journalist working for a local newspaper.

She is writing a newspaper article about how house prices in the local area have changed.

Diana has house price data for **1996** and for **2016**

She plans to include in her article the median house price for **1996** and the median house price for **2016**

(continued on the next page)

14. continued.

Mika thinks that Diana should also include in her article the interquartile range of house prices for **1996** and the interquartile range of house prices for **2016**

(a) Give one reason why including the interquartile ranges in the article would be appropriate. (1 mark)

(continued on the next page)

14. continued.

(b) Give one reason why including the interquartile ranges in the article would NOT be appropriate.

(1 mark)

(Total for Question 14 is 2 marks)

15. Look at the information for Question 15 in the Data Book.

Derek says,

"The probability that the petrol car has a manual gearbox is greater than the probability that the diesel car has a manual gearbox".

Is he correct?

You must show working and justify your answer.

(5 marks)

Answer space is on the next two pages.

15. continued.

15. continued.

(Total for Question 15 is 5 marks)

16. In 2016, the population of New Zealand was 4 660 833

In the same year, there were 59 430 births in New Zealand.

(Source: www.worldometers.info and www.stats.govt.nz)

(a) Using the formula below, work out the crude birth rate for New Zealand in 2016

$$\text{crude birth rate} = \frac{\text{number of births} \times 1000}{\text{total population}}$$

Give your answer correct to 1 decimal place.

(2 marks)

Answer space is on the next page.

16. (a) continued.

(continued on the next page)

16. continued.

The crude birth rate for Albania in 2015 was 12

The crude birth rate for Bolivia in 2015 was 24

(Source: data.worldbank.org)

Louise says,

“There were twice as many births in Bolivia as in Albania in 2015”

(continued on the next page)

16. continued.

(b) State what must be true about the populations of Albania and Bolivia for Louise to be correct.

(1 mark)

(Total for Question 16 is 3 marks)

17. Look at the diagram and the table for Question 17 in the Data Book.

Mark is investigating how the total mileage, x miles, of a car affects its price, £y

He has collected information about two models of car, model A and model B

He found the total mileage and the price of each of ten cars for each model.

He used his information to draw two scatter diagrams, one for each model.

(continued on the next page)

17. continued.

The diagram shows a sketch of the axes he used for each scatter diagram.

On each scatter diagram, Mark drew a line of best fit.

For each line he calculated its gradient and found its intercept on the y–axis.

The table below the diagram shows his results.

(continued on the next page)

17. continued.

Interpret and compare these results in context.

(5 marks)

Answer lines continue on the next page.

17. continued.

(Total for Question 17 is 5 marks)

TOTAL FOR PAPER IS 80 MARKS

END OF PAPER