

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

Total Marks

Statistics
PAPER 2
Foundation Tier
(Calculator)

Time: 1 hour 30 minutes

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

Surname					
Other names					
Centre Number					
Candidate Number					

YOU MUST HAVE

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

YOU WILL BE GIVEN

Data Booklet

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 in case
you need them.**

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. Look at the table for Question 1 in the Data Booklet.
It shows an incomplete tally chart.
For a survey, Kayleigh counted the number of people in each of the **20** cars that arrived at her office car park one morning.

Here are her results.

1	1	2	2	3	3	1	3	1	1
1	5	1	3	2	1	3	1	2	2

- (a) Fill in the tally chart for this information **AND** complete the frequency column.
There are ten spaces to fill.
(2 marks)

(continued on the next page)

1. continued.

(b) Write down the mode.

(1 mark)

(continued on the next page)

1. continued.

At Kayleigh's office there is a scheme to reduce the number of cars arriving at the office car park which have only 1 person in the car.

Kayleigh concludes from her survey that the scheme is not working.

(c) Explain whether or not Kayleigh's results support her conclusion.

(2 marks)

(continued on the next page)

Turn over

1. continued.

John suggests that Kayleigh's results are not suitable for her to reach a reliable conclusion.

(d) Give one reason why John may be correct.
(1 mark)

(Total for Question 1 is 6 marks)

2. Look at the table for Question 2 in the Data Booklet. It shows information about the results of a survey into 'Charitable Giving and Social Activity' over a four week period.

For example, **40%** of all of those surveyed said that they had donated money to charity, but for **16 – 24** year olds this was only **26%**

Some people in the survey said that they took part in more than one of the given activities.

7% of those aged **16 – 24** took part in one of the activities.

(a) Which activity?

(1 mark)

(continued on the next page)

2. continued.

(b) Of those who Volunteered for a charity, which age group had the greatest percentage?

(1 mark)

One of the people surveyed is selected at random.

This person had Bought an ethical product.

(c) Describe the most likely gender and age group for this person.

(2 marks)

(continued on the next page)

2. continued.

(d) Describe the relationship suggested by the data between age and having Given goods to charity.

(1 mark)

(continued on the next page)

2. continued.

Laura is going to do a Sponsored bike ride for charity.

She uses the information in the table to suggest that more than half the people who sponsor her will be female.

(e) Explain how the information in the table supports this suggestion.

(1 mark)

(Total for Question 2 is 6 marks)

- 3. Look at the diagram for Question 3 in the Data Booklet.**

It shows a number line.

The following four sentences are about different events.

- A The likelihood of an event is evens.**
- B An event is certain to happen.**
- C When a fair dice numbered 1 to 6 is rolled, it lands on a number greater than 2**
- D The next birthday of a person picked at random is on a Monday.**

The number line in the Data Booklet has arrows marking five probabilities.

- (a) Write the letter for each event on the arrow that is in the best position to show the probability of each of the four events.**

(3 marks)

(continued on the next page)

3. continued.

Eddie has a biased coin.

He wants to find an estimate for the probability that when he throws the coin it will land Heads.

(b) Explain briefly how he could do this.

(1 mark)

(Total for Question 3 is 4 marks)

4. Look at the table for Question 4(a) in the Data Booklet.

It shows an incomplete table.

Nikola asks **50** male and **50** female drivers arriving at a car park if the type of car they are driving is petrol, diesel or electric.

The two–way table shows some information about her results.

- (a) Complete the two–way table.

There are three spaces to fill.

(2 marks)

(continued on the next page)

4. continued.

Look at the diagram for Question 4(b) in the Data Booklet.

It shows two pie charts.

Nikola wants to compare her results for male drivers with her results for female drivers.

To do this she uses the information she collected to draw the two pie charts shown in the Data Booklet.

(b) Work out the angle for electric cars in the pie chart for male drivers.

You must show the calculation.

(2 marks)

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(continued on the next page)

Turn over

4. continued.

Nikola told Seb how she collected her data.

She then gave Seb a copy of each of her two pie charts and asked him to tell her what they showed.

Seb used the pie charts to reach the following conclusions.

(i) The most common type of car is diesel.

(ii) Males are more likely than females to be drivers of electric cars.

(c) Use the information in the PIE CHARTS in the Data Booklet to assess Seb's two conclusions. You should also consider how Nikola's data collection method affects the reliability of Seb's conclusions.

(5 marks)

Answer lines continue on the next two pages.

Turn over

4. (c) continued.

[illegible]

Turn over

4. (c) continued.

(Total for Question 4 is 9 marks)

5. (a) Explain what is meant by a simple random sample.
(1 mark)

(continued on the next page)

5. continued.

The manager of a health centre is reviewing the amount of time allowed for each patient to be seen by a doctor.

The manager wants to get the opinions of the people registered at the health centre.

She plans to give a questionnaire to each patient who has an appointment with a doctor next Monday. She wants each patient to complete the questionnaire at home and return the completed questionnaire to the health centre.

(b) Assess the manager's plan to get the opinions of the people registered at the health centre.

(3 marks)

Answer lines continue on the next page.

Turn over

5. (b) continued.

(continued on the next page)

5. continued.

Here is an open question that the manager is considering for her questionnaire.

What do you think about the **5** minutes currently allowed for appointments?

This is not a good question.

(c) Give one reason why.
(1 mark)

(continued on the next page)

5. continued.

(d) Design a suitable closed question for the manager to use on her questionnaire so that she can decide how long should be allowed for each patient to be seen by a doctor.

(2 marks)

(continued on the next page)

5. continued.

When the manager has designed her questionnaire, she decides to pre-test it by using a pilot survey with a small sample of patients.

(e) From the five options below, mark the THREE that are the best reasons for the manager to pre-test her questionnaire in this way.

(2 marks)

☐

To check for spelling mistakes

☐

To check the questions are understood

☐

To see if she gets the information she needs

☐

To check the questions are not offensive

☐

To see how long the questionnaire takes to complete

(Total for Question 5 is 9 marks)

6. A garden centre has a register of **400** loyalty card members.

The owner of the garden centre wants to find out information about the distribution of the amount of money spent by each loyalty card member on each visit to the garden centre.

The owner decides on the following plan.

- Record the amount of money spent by each of the first **50** customers to the garden centre on Monday morning.
- Draw a bar chart for the amounts of money spent.
- Find the mean of the amounts of money spent.

(continued on the next page)

6. continued.

Discuss whether the manager's plan is likely to be effective.

You should comment on both the collection of data and on the analysis of results.

Where appropriate you should suggest improvements to the plan.

(6 marks)

Answer lines continue on the next page.

6. continued.

[illegible]

(Total for Question 6 is 6 marks)

Turn over

7. Look at the diagram for Question 7 in the Data Booklet.

It shows a probability tree diagram.

On her drive to work Hinata passes through two sets of traffic lights.

The traffic lights work independently.

On any day that Hinata drives to work the probability that she has to stop at the first set of traffic lights is 0.6

the probability that she has to stop at the second set of traffic lights is 0.5

- (a) Complete the probability tree diagram for this information.

There are six spaces to fill.

(2 marks)

(continued on the next page)

7. continued.

(b) Find the probability that Hinata does NOT have to stop at the first set of traffic lights and does NOT have to stop at the second set of traffic lights on her way to work.

(2 marks)

(continued on the next page)

7. continued.

Each week, Hinata drives to work on 5 days.

She says that she can expect to drive to work without having to stop at either set of traffic lights on exactly one day of the week.

(c) Is Hinata correct?

You must show how you get your answer.

(2 marks)

(Total for Question 7 is 6 marks)

8. Look at the table for Question 8 in the Data Booklet.
It shows an incomplete table.

The table gives the populations, in thousands, and
the crude birth rates for two regions of the
United Kingdom in 2016

The table also gives the population, in thousands,
of the United Kingdom in 2016

In 2016 the number of births in the United Kingdom
was 774 835

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

- (a) Using the formula above, work out the crude
birth rate for the United Kingdom in 2016
Give your answer correct to one decimal place
and write your answer in the table in the
Data Booklet.

There is one space to fill.

(2 marks)

Space for working is on the next page.

8. (a) continued.

(continued on the next page)

8. continued.

(b) Work out the number of births in Cumbria
in 2016

(2 marks)

(continued on the next page)

8. continued.

Stephen says that WITHOUT doing any calculations he knows there were more births in Norfolk than in Cumbria, in 2016

- (c) Using the information in the table, explain why Stephen is correct.**
(2 marks)

(Total for Question 8 is 6 marks)

- 9. Look at the table for Question 9 in the Data Booklet. The table gives, for the Isle of Skye, the number of days with rainfall during the 30 days of April 2019 and during the 30 days of June 2019**

- (a) Use the information in the table to find the absolute risk of rainfall for a day in April.**
(1 mark)
-

- (b) Use the information in the table to work out an estimate for the relative risk of rainfall for any June day compared with any April day.**
(1 mark)
-

(continued on the next page)

Turn over

9. continued.

Glen plans to visit the Isle of Skye next year, in either June or July.

The relative risk of rainfall for any July day compared with any June day is 0.8

He does not want it to rain when he visits.

Glen decides to go in July instead of June.

- (c) Explain how the relative risk of 0.8 could be used to justify Glen's decision.**
(1 mark)

(Total for Question 9 is 3 marks)

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

It shows a box plot.

Bill investigated the heights of females competing in different sports.

Using data from the internet, he recorded the height, in cm, of each female in a sample of 15 female rugby players and the height, in cm, of each female in a sample of 15 female basketball players.

He drew the box plot in the Data Booklet for the recorded heights of the 15 female basketball players.

(continued on the next page)

10. continued.

The table below gives information about the recorded heights of the **15** female rugby players.

Greatest height	180 cm
Median height	170 cm
Lower quartile	165 cm
Range	25 cm
Interquartile range	10 cm

- (a) Using the information in the table, draw on the grid in the Data Booklet a box plot for the recorded heights of the **15** female rugby players.**
- (3 marks)**

(continued on the next page)

10. continued.

(b) Compare the two distributions of heights.

Give THREE comparisons and interpret one of your comparisons.

(4 marks)

(continued on the next page)

Turn over

10. continued.

(c) Considering the method that Bill used to collect his data, comment on the reliability of your comparisons in part (b).

(2 marks)

(Total for Question 10 is 9 marks)

11. Look at the table for Question 11 in the Data Booklet.

Irina is investigating whether the percentage of the population of a country living in urban areas has an effect on the life expectancy in that country.

(a) Suggest a hypothesis Irina could use for her investigation.

(1 mark)

(continued on the next page)

11. continued.

Irina collected the information about 10 countries shown in the table in the Data Booklet.

The Urban population (%) refers to the percentage of the population of the country who live in urban areas.

Irina used statistical software to draw a scatter diagram for the information in the table.

(b) Give a reason why a scatter diagram is an appropriate diagram to use.

(1 mark)

(continued on the next page)

11. continued.

(c) For this investigation, which variable is the explanatory variable?

Give a reason for your answer.

(2 marks)

(continued on the next page)

11. continued.

Look at the diagram for Questions 11(d), (e) and (f) in the Data Booklet.

It shows a scatter diagram from the statistical software.

(d) Explain, giving a statistical reason, whether or not this scatter diagram supports your hypothesis in part (a).

(2 marks)

For these 10 countries, the double mean point of the data is $(63.9, 77.8)$

(e) Using this information, draw a line of best fit on the scatter diagram in the Data Booklet.

(2 marks)

(continued on the next page)

Turn over

11. continued.

Using statistical software, Irina finds that the gradient of the line of best fit should be 0.19

**(f) Interpret the gradient of the line of best fit.
(1 mark)**

(continued on the next page)

11. continued.

**Irina now finds that South Africa has
Urban population 65% and Life expectancy
63 years.**

- (g) Determine how this information for South Africa
fits with the relationship shown in the
scatter diagram for the other countries.
(2 marks)**

(Total for Question 11 is 11 marks)

12. Look at the table for Question 12 in the Data Booklet.

The table shows the index number for the average cost of a package holiday for 2018 and for 2019, using 2015 as base year.

A family spent a total of £4650 on a package holiday in 2015

- (a) Work out an estimate for the cost of the same holiday in 2018**
(2 marks)

£_____

(continued on the next page)

Turn over

12. continued.

Thomas does the following calculation to reach a conclusion about the cost of package holidays.

$$110 \cdot 8 - 106 \cdot 9 = 3 \cdot 9$$

The cost of all package holidays increased by 3·9% between 2018 and 2019

(b) Is Thomas correct?

Give reasons for your answer.

(3 marks)

Answer lines continue on the next page.

Turn over

12. (b) continued.

(Total for Question 12 is 5 marks)

TOTAL FOR PAPER IS 80 MARKS

END OF PAPER
