

Name: _____

GCSE Statistics

Questionnaires

Total marks available: 96

Total marks achieved: _____

Instructions

- Use black ink or ball-point pen.
- Fill in the boxes at the top of this page with your name, Centre number and candidate number.
- Answer all questions.
- Answer the questions in the spaces provided
 - 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 marks for each question are shown in brackets
 - use this as a guide as to how much time to spend on each question.

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.

Q1.

Jenny wants to find out what students at her school think about the after-school clubs.

Jenny is going to use a questionnaire.

Here is one of the questions she wants to put on the questionnaire.

It is great that we have a range of clubs at school, isn't it?			
Yes	<input type="checkbox"/>	No <input type="checkbox"/>	Don't know <input type="checkbox"/>

(a) This is not a suitable question.

Explain why.

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(1)

Here is another of the questions that Jenny wants to put on the questionnaire.

How many times a week do you go to an after-school club?			
1-2	<input type="checkbox"/>	2-3 <input type="checkbox"/>	4-5 <input type="checkbox"/>

(b) Discuss whether or not this is a suitable question for the questionnaire.

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(2)

(Total for question = 3 marks)

Q2.

Lian and Natalie own a bookshop.

They are investigating the age of each of their customers and how much each customer spends on books each month.

One question that Lian plans to ask his customers is

"How old are you?"

(a) Explain whether or not this is a good question for Lian to ask.

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(2)

(b) Write a question that could be used on a questionnaire to find out how much each customer spends on books each month.

(2)

Natalie thinks that giving a questionnaire to each customer is better than asking the customers questions face to face.

(c) Give one advantage for each of these methods of collecting data.

Giving a questionnaire:

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Asking questions face to face:

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(2)

(Total for question = 6 marks)

Q3.

Tracy wants to find out what improvements to the youth club are wanted by the members of the club.

She plans to give each member of the club a questionnaire.

Here is part of the questionnaire.

1. Name:
2. Age: 10 to 12 years <input type="checkbox"/> 12 to 14 years <input type="checkbox"/> 14 to 16 years <input type="checkbox"/>
3. Do you agree that the condition of the club needs improving?
Yes <input type="checkbox"/> No <input type="checkbox"/> Don't know <input type="checkbox"/>
4. How much time do you spend in the youth club?
.....
5. Do you know someone who has caused damage in the youth club?
Yes <input type="checkbox"/> No <input type="checkbox"/>

(a) Explain why Question 2 will not give reliable results.

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(1)

(b) Explain why Question 3 is not a good question.

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(1)

(c) Explain why there might be a problem with the answers given to Question 4

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(1)

(d) Explain why the answers given to Question 5 may not be valid.

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(1)

(Total for question = 4 marks)

Q4.

There are 40 scouts in a scout group.

The scout group leader needs to find out the activities the scouts want to do at their summer camp.

He is going to give a questionnaire to all 40 scouts.

(a) State the population.

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(1)

(b) Write down the statistical name for an investigation that gets information from every member of the population.

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(1)

(c) Give one reason why using a **sample** of the scouts in the group is not necessary.

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(1)

(d) Give one possible problem with using a questionnaire with all 40 scouts.

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(1)

The scout leader also wants to find out how long the scouts would like the summer camp to be.

(e) Design a suitable question for the questionnaire.

(2)

(Total for question = 6 marks)

Q6.

Chirag wants to investigate patient satisfaction at the hospital where he works.

Here are the first three questions on the questionnaire he has produced.

I would like to find out if you were satisfied with the service provided by certain departments in this hospital during your visit. Please complete this questionnaire.

1. Do you agree that service in this hospital is very good? Please tick (✓)
Yes No Don't know

2. How often do you come into hospital? Please tick (✓)
0 – 1 times 2 – 3 times 4 or more times

3. In which department of the hospital did you receive treatment? Please tick (✓)
A & E Maternity Physiotherapy Plastic surgery Other

None of these questions is appropriate.
In each case, explain why.

- 1
-
- 2
-
- 3
-

(Total for question = 3 marks)

Q7.

Julie and Bevan own a sandwich company.

They deliver sandwiches to customers for lunch in each of 30 offices every day.
There are a number of customers in each office.

Julie wants to make changes to the sandwich menu.
She decides to find out the opinions of the customers.

(a) Describe the population for the survey.

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(1)

Bevan wants to use a census to collect the customers' opinions.

(b) Write down **one** advantage of using a census.

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(1)

Julie wants to use a sample of the customers, rather than a census.

(c) Give **two** reasons why a sample might be better.

Reason 1

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Reason 2

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(2)

(d) Explain what is meant by a random sample.

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(1)

Julie designs a questionnaire to give to customers.

One question on Julie's questionnaire is

Do you agree that the sandwiches are good value for money?

This is **not** a good question.

(e) Give two reasons why.

Reason 1

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Reason 2

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(2)

Bevan wants to use face to face interviews with the customers.

(f) Give one advantage and one disadvantage of using face to face interviews rather than a questionnaire given to customers.

Advantage

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Disadvantage

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(2)

(Total for Question = 9 marks)

Q8.

A new theatre was built in Appleyard.
Appleyard council wants to find out what people think of the new theatre.
The council decides to collect information using a questionnaire.

(a) State one advantage and one disadvantage of using a questionnaire rather than a face to face interview.

Advantage

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Disadvantage

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(2)

Councillor Flowers wants this question on the questionnaire.

'Do you agree that the new theatre was a good use of council money?'

This is **not** a good question.

(b) Give two reasons why.

Reason 1

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Reason 2

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(2)

The council also wants to know how much people would pay to use the car park at the new theatre.

(c) Design a suitable question for the questionnaire.

(2)

The council decides to send the questionnaire to a sample of people.

(d) Give two advantages of taking a sample.

Advantage 1

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Advantage 2

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(2)

The questionnaire is to be sent to 20 people chosen at random from the local telephone directory.

(e) Discuss whether or not this would give a good sample.

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(2)

(Total for Question is 10 marks)

Q9.

A fitness company is planning to open a new gym in a town.

The company wants to collect information about the health of people in the town.

The company plans to interview people in the town centre and ask them questions from a questionnaire.

Here are two of the questions from the questionnaire.

A How old are you?

B What is your weight?

Discuss whether using these questions in an interview is an appropriate way to collect this information.

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(Total for question = 3 marks)

Q10.

The directors of a company want to make changes to the company's pension scheme.

The directors want to find out what the employees think about the proposed changes to the pension scheme.

The directors will collect the information by using one of two data collection methods.

Method 1: each employee will be interviewed by one of the directors.

Method 2: each employee will complete a questionnaire without filling in their name.

There are 100 employees in the company.

Discuss how appropriate each of these two data collection methods are.

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(Total for question = 4 marks)

Q11.

The employees in an office were asked the following question.

"How generous do you feel is the amount of time allowed for your lunch break?"

This is **not** a good question.

Give **two** reasons why.

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(2)

(Total for question = 2 marks)

Q12.

A new train line is planned to go near to a small town.

David wants to find out what people living in the town think about this train line.

He is going to send a questionnaire to all the homes in the town.

David thinks using questionnaires is better than using a telephone survey.

(a) Give one reason why David thinks this.

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(1)

David wants to put the two questions below on the questionnaire.

<p>Question A</p> <p>How far do you live from where the new train line is going to be built?</p> <p>Question B</p> <p>Do you think that the new train line will</p> <ul style="list-style-type: none"><input type="checkbox"/> be too expensive to build?<input type="checkbox"/> not be needed?<input type="checkbox"/> spoil the area?<input type="checkbox"/> be too noisy? <p>Tick every answer you agree with.</p>
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Both Question A and Question B are **not** good questions.

(b) Give one reason why for each question.

Question A

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Question B

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(2)

David wants to check if the questionnaire will work.
Then he can send it to each home.

(c) How can David check if the questionnaire will work?

Explain your answer.

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(3)
(Total for question = 6 marks)

Q13.

Edward is investigating the amount of money children and adults spend online.

He is going to do a pilot study for his questionnaire.

(a) Describe what a pilot study is **and** give one advantage of using a pilot study.

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(2)

Edward produces a questionnaire with closed questions.

(b) Give one reason why closed questions might be more appropriate than open questions.

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(1)

(Total for question = 3 marks)

Q14.

A company wants to investigate the number of sick days its employees have off work.

The company uses a questionnaire.

Here is one of the questions on the questionnaire.

<p>Roll a fair dice.</p> <p>If you get 1, 2, 3 or 4 tick box A.</p> <p>If you get 5 or 6 answer this question.</p> <p>Have you ever taken a sick day off work when you weren't really sick?</p> <p>If yes, tick box A. If no, tick box B. A <input type="checkbox"/> B <input type="checkbox"/></p>

(a) Assess the appropriateness of the method the company uses.

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(2)

All the company's employees completed the question.

615 ticked box A.

102 ticked box B.

(b) Show that an estimate of the number of employees who ticked box A because they answered yes to the question is 137

(1)

(Total for question = 3 marks)

Q15.

A film company employs Gary to investigate the film-watching habits of people living in the UK.

Gary is going to use a questionnaire.

Here is Question 1 on Gary's questionnaire.

Question 1

Spin a fair coin.

If you get **Heads**, tick box A.

If you get **Tails**, answer this question.

Have you downloaded a film illegally during the last month?

If yes, tick box A. If no, tick box B.

A B

The method used to decide whether or not to answer a question by spinning a coin is called the random response technique.

(a) Explain why this method is used.

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(1)

Gary sends the questionnaire to a sample of people living in a town.

He uses a telephone directory as the sample frame.

For Question 1

743 people ticked box A

679 people ticked box B

(b) Calculate an estimate of the proportion of the people in the sample who had downloaded a film illegally during the last month.

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(3)

Gary is going to write a report on the outcome of Question 1.

He is going to use the answer to part (b) as an estimate of the proportion of all the people living in the UK who had downloaded a film illegally during the last month.

(c) Is it appropriate for Gary to use the answer to part (b)?

Give **two** reasons for your answer.

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(3)

(Total for question = 7 marks)

Q16.

Remi wants to find out about the number of people that avoid paying tax. He used a random response question to collect his data.

This is a suitable technique to use.

(a) Explain why.

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(1)

Here is the random response question that Remi used on a questionnaire.

<p>Roll a fair dice.</p> <p>If you get 1, 2 or 3, tick box A. If you get 4, 5 or 6, answer this question.</p> <p style="text-align: center;">Have you ever avoided paying tax?</p> <p style="text-align: center;">If yes, tick box A. If no, tick box B.</p> <p style="text-align: center;">A <input type="checkbox"/> B <input type="checkbox"/></p>
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Remi sent the questionnaire to a sample of people.

For this question,

- 426 people ticked box A
- 354 people ticked box B

A group of researchers also collected data on the number of people that avoid paying tax by directly asking people.

They found that 5.9% of the people they asked said that they had avoided paying tax.

(Source: *www.emeraldinsight.com*)

(b) Compare the results of Remi's questionnaire with the results obtained by the researchers.

You should consider whether the use of the random response technique was effective and you should give a limitation of your conclusion.

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(5)

(Total for question = 6 marks)

Q17.

John wants to know which pets are more popular, dogs or cats.

Write down a question that John could use on a questionnaire to investigate this.

(1)

(Total for question = 1 mark)

Q18.

A record company wants to estimate the proportion of people who downloaded music illegally during the last month.

They want people to be able to give honest answers so they designed the survey below.

Flip a fair coin. Keep the result to yourself.

- If you get Heads on the coin, tick box A.
- If you get Tails on the coin, answer this question.

Have you downloaded music illegally during the last month?

If yes, tick box A. If no, tick box B.

A B

1000 people completed the survey.

(a) Estimate the number of people who got Heads on the coin.

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(1)

560 of the 1000 people ticked box A.

(b) Estimate the proportion of people who downloaded music illegally during the last month.

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(2)

(Total for question = 3 marks)

Q19.

Naomi wants to find out what opinions people in her town have about holidays.

She designed a questionnaire and gave it to each person in a sample of 30 people who live in her town to complete.

Her questionnaire, her results and her conclusions are shown below.

Questionnaire:

1. Do you agree that August is the best month to go on holiday?
2. Where is your favourite place to go on holiday?
3. How much do you spend on holiday? (Tick one box)

Less than £500 More than £800

Results:

1. 22 responded yes and 8 responded no.
2. 2 people said 'beach'. The other 28 people each gave a different answer.
3. 6 ticked 'less than £500' and 24 ticked 'more than £800'

Conclusions:

1. August is the favourite month to go on holiday.
2. The beach is the favourite place to go on holiday.
3. Most people spend more than £800 a week when on holiday.

Discuss whether or not the questions on Naomi's questionnaire are appropriate and whether or not the results can be used to support Naomi's conclusions.

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(Total for question = 6 marks)

Q20.

Emily is designing a questionnaire to obtain information about how people in Manchester travel to work.

Before she gives out the questionnaire, she is going to do a pilot study.

(a) Give a reason why a pilot study is a suitable thing for her to do.

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(1)

(b) Discuss whether or not it would be appropriate to carry out the pilot study on the entire population.

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(1)

One of the questions on Emily's questionnaire is designed to collect qualitative data.
Jane suggests to Emily that she should draw a histogram for the data collected from this question.

(c) Comment on Jane's suggestion.

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(1)

(Total for question = 3 marks)

Q21.

Mehmet wants to conduct an investigation about school meals at his school. He wants to take a sample of students from his school.

(a) Write down a sampling frame he could use.

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(1)

Mehmet has two hypotheses:

- Younger students have school meals, rather than packed lunches, more often than older students do.
- More female students than male students are vegetarian.

Here are sections A, B and C of his plan for his investigation.

A. Sampling method:
Take a sample of 10 students from each of the year groups at school.

B. Questions:

1. What is your gender? Please tick (✓)
Male Female

2. What is your year group? Please tick (✓)
Year 7 Year 8 Year 9 Year 10 Year 11 Year 12 Year 13

3. What is your favourite meal?.....

4. Do you think eating meat is cruel to animals? Please tick (✓)
Yes No

5. How often do you eat school meals? Please tick (✓)
Once Two times Three times Four times Five times

C. Presenting data:
Draw a bar chart with age on horizontal axis and total number of school meals on vertical axis (to see if younger students have taller bars).

Draw a pictogram showing number of vegetarian females and number of vegetarian males.

(b) Name the sampling method that Mehmet plans to use.

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(1)

(c) Discuss whether or not Mehmet's plans are appropriate.
You must comment on each of the three sections A, B and C.

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(5)

(Total for question = 7 marks)