

Write your name here

Surname

Other Names

AS/A Level Mathematics

Sampling

Candidates may use any calculator allowed by the regulations of the Joint Council for Qualifications. Calculators must not have the facility for symbolic algebra manipulation, differentiation and integration, or have retrievable mathematical formulae stored in them.

Instructions

- Use **black** ink or ball-point pen.
- If pencil is used for diagrams/sketches/graphs it must be dark (HB or B).
- **Fill in the boxes** at the top of this page with your name.
- Answer **all** questions and ensure that your answers to parts of questions are clearly labelled..
- Answer the questions in the spaces provided
– there may be more space than you need.
- You should show sufficient working to make your methods clear.
Answers without working may not gain full credit.
- Answers should be given to three significant figures unless otherwise stated.

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.

1 Here are some descriptions of sampling methods.

A: The population is split into groups and a proportional representation of the different groups is selected.

B: Every member of the population has an equal chance of being selected.

C: A convenient sample is taken from any members of the population at any time.

D: A repetitive system used to select a sample from the population.

E: The population is split into groups and a certain number from each group is chosen in any order.

In the table below, match each sampling method with the letter of its description.

Method	Letter
Quota Sampling	
Stratified Sampling	
Simple Random Sampling	
Opportunity Sampling	
Systematic Sampling	

(Total for question 1 is 2 marks)

2 The headteacher of a school wants to find out what students think about the school. She decides to take a census rather than a sample.

(a) What is the population for the census? (1)

(b) Give one advantage and one disadvantage of using a census. (2)

(Total for question 2 is 3 marks)

3 A gym wants to find out what its members think about the gym's opening times and decides to carry out a survey.

(a) Suggest a suitable sampling frame for the survey (1)

(b) Identify the sampling units (1)

The gym decides to ask the first 20 members that come into the gym one morning to complete the survey.

(c) State the sampling technique the gym used. (1)

(d) Give one advantage and one disadvantage of this technique. (2)

(Total for question 3 is 3 marks)

4 Kwame wants to investigate how much time year 7 students in his school spend playing sport. He gets a list of year 7 students and selects every 5th student on the list to add to his sample.

(a) Write down the name of the sampling method Kwame has chosen. (1)

(b) Give one advantage and one disadvantage of this sampling method. (2)

(Total for question 4 is 3 marks)

5 Frank wants to find out how much time students in his school spend listening to music.

He asks students entering the school until he has asked 25 boys and 25 girls.

(a) Write down the name of the sampling method Frank has chosen. (1)

(b) Give one advantage and one disadvantage of this sampling method. (2)

(Total for question 5 is 3 marks)

6 The table shows information about the number of students in a school.

	Year Group					Total
	7	8	9	10	11	
Boys	71	65	59	55	48	298
Girls	65	54	53	50	53	275
Total	136	119	112	105	101	573

A teacher wants to find out what students think about the school's canteen. They decide to take a sample of 60 students stratified by age and by year group.

Calculate the number of year 11 girls in the sample.

(Total for question 6 is 2 marks)

7 There are 550 students in a school They all study either French or German or Spanish.

Language	French	Spanish	German
Number of Students	181	146	223

An inspector decides to take a sample of 40 students stratified by the language they study.

Calculate the number of students who study German in the sample.

(Total for question 7 is 2 marks)