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Sampling and Data Collection Exam Questions Sheet 2

Q1.

(a) State two reasons why stratified sampling might be a more suitable sampling method than simple random sampling.

(2)

(b) State two reasons why stratified sampling might be a more suitable sampling method than quota sampling.

(2)

(Total for question = 4 marks)

Q2.

(a) Explain what you understand by a random sample from a finite population.

(1)

(b) Give an example of a situation when it is not possible to take a random sample.

(1)

A college lecturer specialising in shoe design wants to change the way in which she organises practical work.

She decides to gather ideas from her 75 students.

She plans to give a questionnaire to a random sample of 8 of these students.

(c) (i) Describe the sampling frame that she should use.

(ii) Explain in detail how she should use a table of random numbers to obtain her sample.

(3)

(Total 5 marks)

Q3.

A company director decides to survey staff about changes to the company calendar. The company has staff in 4 different job roles

72 managers, 108 drivers, 180 administrators and 360 warehouse staff.

The director decides to take a stratified sample.

(a) Write down one advantage of using a stratified sample rather than a simple random sample for this survey.

(1)

(b) Find the number of staff in each job role that will be included in a stratified sample of 40 staff.

(3)

(c) Describe how to choose managers for the stratified sample.

(2)

(Total for question = 6 marks)

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Q4.

(a) State two reasons why stratified sampling might be a more suitable sampling method than simple random sampling.

(2)

(b) State two reasons why stratified sampling might be a more suitable sampling method than quota sampling.

(2)

(Total for question = 4 marks)

Q5.

A gym club has 400 members of which 300 are males.

Explain clearly how a stratified sample of size 60 could be taken.

(3)

(Total 3 marks)

Q6.

A college manager wants to survey students' opinions of enrichment activities. She decides to survey the students on the courses summarised in the table below.

Course	Number of students enrolled
Leisure and Sport	420
Information Technology	337
Health and Social Care	200
Media Studies	43

Each student takes only one course.

The manager has access to the college's information system that holds full details of each of the enrolled students including name, address, telephone number and their course of study. She wants to compare the opinions of students on each course and has a generous budget to pay for the cost of the survey.

(a) Give one advantage and one disadvantage of carrying out this survey using

(i) quota sampling,
(ii) stratified sampling.

(2)

The manager decides to take a stratified sample of 100 students.

(b) Calculate the number of students to be sampled from each course.

(3)

(c) Describe how to choose students for the stratified sample.

(2)

(Total 7 marks)

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Q7.

A lake contains 3 species of fish. There are estimated to be 1400 trout, 600 bass and 450 pike in the lake. A survey of the health of the fish in the lake is carried out and a sample of 30 fish is chosen.

(a) Give a reason why stratified random sampling cannot be used.

(1)

(b) State an appropriate sampling method for the survey.

(1)

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

(2)

(d) Explain how this sampling method could be used to select the sample of 30 fish. You must show your working.

(4)

(Total 8 marks)

Q8.

(a) Explain what you understand by a census.

(1)

Each cooker produced at GT Engineering is stamped with a unique serial number. GT Engineering produces cookers in batches of 2000. Before selling them, they test a random sample of 5 to see what electric current overload they will take before breaking down.

(b) Give one reason, other than to save time and cost, why a sample is taken rather than a census.

(1)

(c) Suggest a suitable sampling frame from which to obtain this sample.

(1)

(d) Identify the sampling units.

(1)

(Total 4 marks)

Q9.

(a) Explain what you understand by a census.

(1)

Each cooker produced at GT Engineering is stamped with a unique serial number. GT Engineering produces cookers in batches of 2000. Before selling them, they test a random sample of 5 to see what electric current overload they will take before breaking down.

(b) Give one reason, other than to save time and cost, why a sample is taken rather than a census.

(1)

(c) Suggest a suitable sampling frame from which to obtain this sample.

(1)

(d) Identify the sampling units.

(1)

(Total 4 marks)

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Q10.

A telephone directory contains 50 000 names. A researcher wishes to select a systematic sample of 100 names from the directory.

(a) Explain in detail how the researcher should obtain such a sample.

(2)

(b) Give one advantage and one disadvantage of

(i) quota sampling,

(ii) systematic sampling.

(4)

(Total 6 marks)

Q11.

A researcher is hired by a cleaning company to survey the opinions of employees on a proposed pension scheme. The company employs 55 managers and 495 cleaners.

To collect data the researcher decides to give a questionnaire to the first 50 cleaners to leave at the end of the day.

(a) Give 2 reasons why this method is likely to produce biased results.

(2)

(b) Explain briefly how the researcher could select a sample of 50 employees using

(i) a systematic sample,
(ii) a stratified sample.

(6)

Using the random number tables in the formulae book, and starting with the top left hand corner (8) and working across, 50 random numbers between 1 and 550 inclusive were selected. The first two suitable numbers are 384 and 100.

(c) Find the next two suitable numbers.

(2)

(Total 10 marks)

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