Sampling Techniques: exam practice

10 questions · 23 marks · worked solutions and markschemes

Name _____ Date _____ Score / 23

- Answer every question before you look at the solutions. They start after the last question, with the marks for each line: M for method, A for accuracy, R for reasoning.
- Online, with more practice: ibmathrevision.com/hlai/sampling-techniques-exam-practice

1. **3 marks · Paper 1 style · calculator allowed**

Name each sampling method: (i) numbering a population and using random numbers; (ii) choosing every 20th name on a list; (iii) asking whoever passes by.

Name each method. **[3]**

2. **2 marks · Paper 1 style · calculator allowed**

A survey on school lunches asks only students in the lunch queue.

Explain why the sample may be biased and suggest a better method. **[2]**

3. **2 marks · Paper 1 style · calculator allowed**

A quota sample of 40 adults is required: 20 men and 20 women.

Explain how a quota sample differs from a stratified sample. **[2]**

4. **2 marks · Paper 1 style · calculator allowed**

A town has 2400 households: 1500 in flats and 900 in houses. A stratified sample of 80 households is taken by type.

Find how many households of each type are sampled. **[2]**

5. **2 marks · Paper 1 style · calculator allowed**

A researcher divides a city into 50 districts, picks 5 districts at random and surveys every household in them.

Name this sampling method and give one disadvantage. **[2]**

6. **2 marks · Paper 1 style · calculator allowed**

State whether each is a population or a sample: (i) all students in a school, studied by the head; (ii) 30 students chosen to answer a survey.

Classify each. **[2]**

7. **2 marks · Paper 1 style · calculator allowed**

A school of 1200 students uses a simple random sample of 60.

Describe how to choose the sample and find the probability that a given student is chosen. **[2]**

8. **2 marks · Paper 1 style · calculator allowed**

A gym asks members to fill in an online survey; 8% respond.

Name the type of sampling and explain why the results may be unreliable. **[2]**

9. **3 marks · Paper 1 style · calculator allowed**

A club has 90 juniors, 150 adults and 60 seniors. A stratified sample of 50 members is chosen.

Find the number from each group. **[3]**

10. **3 marks · Paper 1 style · calculator allowed**

A factory checks every 25th item from a production run of 1000, starting at item 7.

Name the method, find the number of items checked and the number of the last item checked. **[3]**

Answers and worked solutions

Question 1 3 marks

Answer: simple random; systematic; convenience

simple random **A1**

systematic **A1**

convenience **A1**

Question 2 2 marks

Answer: a proof: the worked solution above is the full answer

students who bring lunch are left out **R1**

a random or stratified sample from the whole school **A1**

Question 3 2 marks

Answer: a proof: the worked solution above is the full answer

quota: members chosen by the interviewer until each quota is filled **A1**

stratified: random selection within each group **A1**

Question 4 2 marks

Answer: 50 flats, 30 houses

50 flats **A1**

30 houses **A1**

Question 5 2 marks

Answer: cluster sampling

cluster sampling **A1**

the chosen districts may not represent the city **R1**

Question 6 2 marks

Answer: population; sample

population **A1**

sample **A1**

Question 7 2 marks

Answer: $\frac{1}{20}$

number students 1 to 1200 and use random numbers, ignoring repeats **A1**

$\frac{1}{20}$ **A1**

Question 8 2 marks

Answer: a proof: the worked solution above is the full answer

self-selected (voluntary) sampling **A1**

those who respond may have stronger views **R1**

Question 9 3 marks

Answer: 15, 25, 10

15 juniors **A1**

25 adults **A1**

10 seniors **A1**

Question 10 3 marks

Answer: systematic; 40; 982

systematic **A1**

40 items **A1**

item 982 **A1**

Every solution is also on ibmathrevision.com/hlai/sampling-techniques-exam-practice
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