

## 3.3 Random Sampling and Data Collection

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Name: \_\_\_\_\_ Class: \_\_\_\_\_ Date: \_\_\_\_\_

Total: 9 marks

KEY WORDS sample 样本 • cluster 整群 • random sampling 随机抽样 • systematic 系统 • bias 偏差

### Objective

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Build the skills to answer exam questions on **random sampling and data collection**.

You must be able to:

- explain why **random sampling** 随机抽样 helps produce a representative sample
- describe a **simple random sample (SRS)** 简单随机抽样
- distinguish **stratified** 分层, **cluster** 整群, and **systematic** 系统 random sampling

### 1 Worked examples

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Study these first. Each one shows the method for a question type used later.

#### ■ Why random?

**Random sampling** gives every individual a known chance of selection, which produces a **representative** sample and reduces bias.

#### ■ Sampling methods

- **Simple random sample (SRS)** — every possible sample of the chosen size is equally likely.
- **Stratified** — split into groups (strata), then randomly sample **within each**.
- **Cluster** — randomly select whole **groups** and use everyone in them.
- **Systematic** — pick every  $k$ -th individual from a list.

### 2 Practice

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2.1 State why random sampling helps. [1]

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2.2 Describe a simple random sample. [1]

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**2.3** Name two other types of random sampling. [2]

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### 3 Exam-style questions

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**3.1** Random sampling helps produce a \_\_\_\_\_ sample. [1]

- **A** biased
- **B** representative
- **C** small
- **D** voluntary

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**3.2** Splitting a population into groups and randomly sampling within each is \_\_\_\_\_ sampling. [1]

- **A** cluster
- **B** stratified
- **C** systematic
- **D** voluntary

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**3.3** A school selects every 10th student on an alphabetical list.

(a) Name this sampling method. [1]

(b) State one benefit of random sampling. [1]

(c) Name a method that samples whole groups. [1]

## Solutions

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**2.1** it gives a representative sample and reduces bias.

**2.2** a sample in which every possible group of that size is equally likely to be chosen.

**2.3** any two of: stratified, cluster, systematic.

**3.1** B.

**3.2** B.

**3.3** (a) systematic sampling. (b) it reduces bias / gives a representative sample. (c) cluster sampling.