

TEXAS A&M UNIVERSITY (TAMU) STAT 201 ELEMENTARY STATISTICAL INFERENCE EXAM 1 PRACTICE (SAMPLE)

STUDY GUIDE



SAMPLE STUDY GUIDE WITH LIMITED QUESTIONS

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Introduction

Preparing for a certification exam can feel overwhelming, but with the right tools, it becomes an opportunity to build confidence, sharpen your skills, and move one step closer to your goals. At Examzify, we believe that effective exam preparation isn't just about memorization, it's about understanding the material, identifying knowledge gaps, and building the test-taking strategies that lead to success.

This guide was designed to help you do exactly that.

Whether you're preparing for a licensing exam, professional certification, or entry-level qualification, this book offers structured practice to reinforce key concepts. You'll find a wide range of multiple-choice questions, each followed by clear explanations to help you understand not just the right answer, but why it's correct.

The content in this guide is based on real-world exam objectives and aligned with the types of questions and topics commonly found on official tests. It's ideal for learners who want to:

- Practice answering questions under realistic conditions,
- Improve accuracy and speed,
- Review explanations to strengthen weak areas, and
- Approach the exam with greater confidence.

We recommend using this book not as a stand-alone study tool, but alongside other resources like flashcards, textbooks, or hands-on training. For best results, we recommend working through each question, reflecting on the explanation provided, and revisiting the topics that challenge you most.

Remember: successful test preparation isn't about getting every question right the first time, it's about learning from your mistakes and improving over time. Stay focused, trust the process, and know that every page you turn brings you closer to success.

Let's begin.

How to Use This Guide

This guide is designed to help you study more effectively and approach your exam with confidence. Whether you're reviewing for the first time or doing a final refresh, here's how to get the most out of your Examzify study guide:

1. Start with a Diagnostic Review

Skim through the questions to get a sense of what you know and what you need to focus on. Your goal is to identify knowledge gaps early.

2. Study in Short, Focused Sessions

Break your study time into manageable blocks (e.g. 30 – 45 minutes). Review a handful of questions, reflect on the explanations.

3. Learn from the Explanations

After answering a question, always read the explanation, even if you got it right. It reinforces key points, corrects misunderstandings, and teaches subtle distinctions between similar answers.

4. Track Your Progress

Use bookmarks or notes (if reading digitally) to mark difficult questions. Revisit these regularly and track improvements over time.

5. Simulate the Real Exam

Once you're comfortable, try taking a full set of questions without pausing. Set a timer and simulate test-day conditions to build confidence and time management skills.

6. Repeat and Review

Don't just study once, repetition builds retention. Re-attempt questions after a few days and revisit explanations to reinforce learning. Pair this guide with other Examzify tools like flashcards, and digital practice tests to strengthen your preparation across formats.

There's no single right way to study, but consistent, thoughtful effort always wins. Use this guide flexibly, adapt the tips above to fit your pace and learning style. You've got this!

Questions

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1. Given $Q1 = 194,250$ and $Q3 = 649,000$, what is the interquartile range (IQR) of the data set?
 - A. 259,750
 - B. 454,750
 - C. 844,000
 - D. 1,095,000
2. In the aspirin trial, what are experimental units?
 - A. The pills.
 - B. Each man in the study.
 - C. The group taking aspirin.
 - D. The group taking placebo.
3. If a data point has z-score -1.5 , where is it relative to the mean?
 - A. 1.5 standard deviations above the mean
 - B. 1.5 standard deviations below the mean
 - C. 1.5 times the standard deviation
 - D. Exactly at the mean
4. Non-response bias description.
 - A. Collected responses always represent the population
 - B. Non-response bias disappears with large samples
 - C. Non-response has no effect on representativeness
 - D. Collected responses may no longer be representative of the populations
5. A data set that has two values with the highest frequency is described as
 - A. Unimodal
 - B. Bimodal
 - C. Multimodal
 - D. Uniform

- 6. Which statement describes cluster sampling?**
- A. All members from selected clusters are included.
 - B. The population is divided into strata and a sample is drawn from each stratum.
 - C. Divide the population into clusters and randomly select some clusters; all members in those clusters are included.
 - D. A non-random sample of convenient individuals is used.
- 7. The freshman, sophomore, junior, and senior years are treated as four groups; two years are selected randomly and all students in those two years are surveyed. What type of sampling is this?**
- A. Stratified
 - B. Cluster
 - C. Systematic
 - D. Convenience
- 8. Which statement correctly characterizes a z-score?**
- A. It is always a fraction between 0 and 1.
 - B. It depends on the sample size.
 - C. It measures how many standard deviations a value is from the mean.
 - D. It is the same as the data point's percentile.
- 9. In the stratified sampling example with five departments and a total of 50, selecting 10 from each department illustrates which approach?**
- A. Proportional stratified sampling
 - B. Equal allocation stratified sampling
 - C. Cluster sampling
 - D. Convenience sampling
- 10. An observational study is best described as an investigation that:**
- A. Observes individuals and measures variables of interest; does not attempt to influence responses.
 - B. Deliberately imposes a treatment on individuals.
 - C. Randomizes subjects to groups.
 - D. Collects data only from experiments.

Answers

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1. B
2. B
3. B
4. D
5. B
6. C
7. B
8. C
9. B
10. A

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Explanations

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1. Given $Q1 = 194,250$ and $Q3 = 649,000$, what is the interquartile range (IQR) of the data set?

- A. 259,750
- B. 454,750**
- C. 844,000
- D. 1,095,000

Interquartile range measures how spread out the middle 50% of the data is, and it is found by subtracting the first quartile from the third quartile. With $Q3 = 649,000$ and $Q1 = 194,250$, the $IQR = 649,000 - 194,250 = 454,750$. This matches the value corresponding to the correct option. The other numbers don't come from subtracting $Q1$ from $Q3$, so they don't represent the IQR.

2. In the aspirin trial, what are experimental units?

- A. The pills.
- B. Each man in the study.**
- C. The group taking aspirin.
- D. The group taking placebo.

The experimental unit is the entity to which a treatment is applied and on which the response is measured. In this aspirin trial, the treatment (aspirin vs placebo) is given to individual people, and the outcome is recorded for each person. So the experimental units are the individual men in the study. The pills themselves are just the delivery method for the treatment, not the unit.

3. If a data point has z-score -1.5, where is it relative to the mean?

- A. 1.5 standard deviations above the mean
- B. 1.5 standard deviations below the mean**
- C. 1.5 times the standard deviation
- D. Exactly at the mean

A z-score shows how far and in what direction a value is from the mean, measured in standard deviations. A z-score of -1.5 means the data point is 1.5 standard deviations below the mean, since $X = \mu + z\sigma = \mu + (-1.5)\sigma = \mu - 1.5\sigma$. So it sits below the mean by 1.5 times the standard deviation. For example, with a mean of 100 and a standard deviation of 10, the value would be 85, which is 15 below the mean and exactly 1.5 standard deviations lower.

4. Non-response bias description.

- A. Collected responses always represent the population
- B. Non-response bias disappears with large samples
- C. Non-response has no effect on representativeness
- D. Collected responses may no longer be representative of the populations**

Non-response bias happens when the people who respond to a survey differ in important ways from those who don't respond, so the collected responses may not reflect the true characteristics or opinions of the whole population. Because of this difference, the sample can become biased even if you survey a lot of people. Large samples don't automatically fix this; if non-respondents systematically differ from respondents, the results can still misrepresent the population. The other statements aren't accurate: it isn't guaranteed that collected responses always represent the population, non-response bias doesn't disappear with larger samples, and non-response can affect how representative the data are.

5. A data set that has two values with the highest frequency is described as

- A. Unimodal
- B. Bimodal**
- C. Multimodal
- D. Uniform

The concept here is about how many peaks the distribution has in terms of the most frequent values. When a data set has two values that occur with the same highest frequency, those two values are both the most common, so the distribution has two modes. That situation is called bimodal. This shows up as two humps or peaks in a histogram or frequency table. For example, if 0 and 1 each appear twice while other values appear less often, there are two modes, making the data bimodal. If only one value is the most frequent, it's unimodal. If more than two values share the top frequency, it's multimodal. If frequencies are spread out evenly with no standout value, the data look uniform.

6. Which statement describes cluster sampling?

- A. All members from selected clusters are included.
- B. The population is divided into strata and a sample is drawn from each stratum.
- C. Divide the population into clusters and randomly select some clusters; all members in those clusters are included.**
- D. A non-random sample of convenient individuals is used.

Cluster sampling works by first breaking the population into clusters, which are natural groups that collectively resemble the whole population. Then you randomly select some of those clusters and include every member of the chosen clusters in your sample. The key ideas are forming clusters and using random selection of clusters, with all individuals in the selected clusters included. This is different from stratified sampling, where you divide the population into groups (strata) and sample from each stratum, not by whole clusters. It's also different from convenience sampling, which picks individuals based on ease of access. The statement describing cluster sampling precisely matches the method: divide into clusters, randomly choose some clusters, and include all members in those clusters.

7. The freshman, sophomore, junior, and senior years are treated as four groups; two years are selected randomly and all students in those two years are surveyed. What type of sampling is this?

- A. Stratified
- B. Cluster**
- C. Systematic
- D. Convenience

This is cluster sampling. The population is divided into natural groups (freshmen, sophomores, juniors, seniors), and a random subset of those groups is chosen. Then everyone in the selected groups is surveyed. That matches the idea of picking entire clusters and surveying all members within them. It's not stratified sampling, because in stratified sampling you would take samples from each group to represent all groups, not survey every member of the chosen groups. It's not systematic sampling, which would involve selecting every kth individual from a list. It's not convenience sampling, which would pick groups that are easiest to reach.

8. Which statement correctly characterizes a z-score?

- A. It is always a fraction between 0 and 1.
- B. It depends on the sample size.
- C. It measures how many standard deviations a value is from the mean.**
- D. It is the same as the data point's percentile.

Z-scores quantify where a data point sits relative to the distribution, in units of standard deviation. They answer: how far and in which direction the value is from the mean, scaled by the spread of the data. The standard way to compute it is $z = (X \text{ minus the mean}) \text{ divided by the standard deviation}$ (or with a sample, $z = (X \text{ minus the sample mean}) \text{ divided by the sample standard deviation}$). This tells you that a z-score of 2 means the value is two standard deviations above the mean, while a z-score of -1 means one standard deviation below. Because it standardizes by the distribution's spread, z-scores allow you to compare values from different distributions or scales. They are not confined to a 0 to 1 range; they can be any real number. They do not directly describe a percentile, though you can translate a z-score into a percentile under the normal curve. They also aren't defined by sample size themselves, though estimating the standard deviation from data can introduce sampling variability.

9. In the stratified sampling example with five departments and a total of 50, selecting 10 from each department illustrates which approach?

- A. Proportional stratified sampling
- B. Equal allocation stratified sampling**
- C. Cluster sampling
- D. Convenience sampling

Equal allocation in stratified sampling means you take the same number of observations from every stratum. In this example, there are five departments and a total of 50 individuals, and you sample 10 from each department. That exactly assigns the same sample size to every department, no matter their size, which is the hallmark of equal allocation. Proportional allocation would vary how many you sample from each department based on how big each department is; cluster sampling would involve sampling whole clusters rather than fixed numbers from each stratum; convenience sampling picks easy-to-reach individuals.

10. An observational study is best described as an investigation that:

- A. Observes individuals and measures variables of interest; does not attempt to influence responses.**
- B. Deliberately imposes a treatment on individuals.
- C. Randomizes subjects to groups.
- D. Collects data only from experiments.

An observational study involves watching individuals and measuring variables of interest without attempting to influence responses. No treatment is imposed and there's no random assignment by the researcher, so the data reflect what happens in the real world rather than under controlled conditions. The other descriptions describe experiments—where a treatment is deliberately applied or participants are randomized to groups—and that's not what observational studies do. Observational research can use surveys, records, or direct observation in natural settings, not just data from experimental setups.

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Next Steps

Congratulations on reaching the final section of this guide. You've taken a meaningful step toward passing your certification exam and advancing your career.

As you continue preparing, remember that consistent practice, review, and self-reflection are key to success. Make time to revisit difficult topics, simulate exam conditions, and track your progress along the way.

If you need help, have suggestions, or want to share feedback, we'd love to hear from you. Reach out to our team at hello@examzify.com.

Or visit your dedicated course page for more study tools and resources:

<https://tamu-stat201exam1.examzify.com>

We wish you the very best on your exam journey. You've got this!

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