CRINQ Descriptive, Inferential, Clinical Statistics Practice Test (Sample)

Study Guide

BY EXAMZIFY

Everything you need from our exam experts!

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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

1. **Which test would you use to compare three or more related samples when the data are not normally distributed?**
   - A. One-Way ANOVA
   - B. Friedman's ANOVA
   - C. Paired t-test
   - D. Mann-Whitney U

2. **What does the null hypothesis assume?**
   - A. There is an effect or difference
   - B. There is no effect or difference
   - C. The effect is due to bias
   - D. The result is always significant

3. **Which statement correctly differentiates Pearson and Spearman correlations?**
   - A. Pearson is non-parametric and uses ranks; Spearman is parametric and normally distributed.
   - B. Pearson is parametric and assesses linear relationships on continuous, normally distributed data; Spearman is non-parametric and uses ranks on ordinal data.
   - C. Both require normal distribution.
   - D. They measure causation.

4. **The Kruskal-Wallis test is a non-parametric method for comparing three or more what?**
   - A. Means
   - B. Medians
   - C. Variances
   - D. Proportions

5. **The MMT rating system is an example of which data type?**
   - A. Nominal data
   - B. Ordinal data
   - C. Interval data
   - D. Ratio data

6. The non-parametric test for comparing two independent groups is the Mann-Whitney U.

- **A. True**
- **B. False**
- **C. Not sure**
- **D. Both**

7. What can a correlation analyze and what are its limitations?

- **A. It analyzes causation; not sensitive to outliers.**
- **B. It analyzes strength and direction of association but cannot determine causation; sensitive to outliers; only measures linear relationships; third variables may influence results.**
- **C. It proves a causal link.**
- **D. It analyzes only mean differences.**

8. What is Type I error?

- **A. Failing to detect a real effect**
- **B. Detecting an effect when none exists**
- **C. Biased estimate of the mean**
- **D. Random sampling error**

9. If p = 0.18, which interpretation is correct?

- **A. There is an 18% probability that differences are due to chance**
- **B. The results are statistically significant**
- **C. The null hypothesis is false with 18% certainty**
- **D. The study has 18% power**

10. What does a p-value represent?

- **A. Probability of obtaining the observed results if the null hypothesis is true**
- **B. Probability that the null hypothesis is true**
- **C. Probability that the alternative hypothesis is true**
- **D. Probability of sampling error**

Answers

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

Explanations

1. Which test would you use to compare three or more related samples when the data are not normally distributed?

A. One-Way ANOVA

B. Friedman’s ANOVA

C. Paired t-test

D. Mann-Whitney U

When you have three or more related samples (repeated measures on the same subjects) and the data aren’t normally distributed, you use a nonparametric test that compares the central tendencies across multiple related groups. The Friedman test is designed for this situation: it’s the nonparametric counterpart to the repeated-measures ANOVA. It works by ranking the scores within each subject across the different conditions and then testing whether these ranks differ across the conditions. Because it relies on ranks rather than assumptions about normality, it doesn’t require the data to be normally distributed. If the Friedman test shows a difference, you’d typically follow up with post hoc pairwise comparisons using a nonparametric method to identify which conditions differ. This is different from a one-way ANOVA, which assumes independence of observations and normality and is meant for independent groups. It’s also different from a paired t-test, which compares only two related samples, and from the Mann-Whitney U test, which compares two independent samples.

2. What does the null hypothesis assume?

A. There is an effect or difference

B. There is no effect or difference

C. The effect is due to bias

D. The result is always significant

The null hypothesis is a statement that there is no effect or no difference. It provides a baseline assumption for testing, representing what we would expect to see if nothing unusual is happening. When we collect data, we check whether the observed results are unlikely under this no-effect assumption. If they are very unlikely (p-value below the chosen threshold), we reject the null and infer an effect or difference. If they aren’t unlikely enough, we fail to reject the null, meaning the data don’t provide strong evidence of an effect given the sample and variability. So, in this question, the null hypothesis assumes no effect or difference. The other ideas describe scenarios involving an effect, bias, or universal significance, which aren’t what the null statement asserts.

3. **Which statement correctly differentiates Pearson and Spearman correlations?**

   A. **Pearson is non-parametric and uses ranks; Spearman is parametric and normally distributed.**

   B. **Pearson is parametric and assesses linear relationships on continuous, normally distributed data; Spearman is non-parametric and uses ranks on ordinal data.**

   C. **Both require normal distribution.**

   D. **They measure causation.**

Pearson and Spearman differ in what they assume about the data and what kind of relationship they measure. Pearson is a parametric measure that looks at linear relationships between two continuous variables and relies on the data being approximately normally distributed (and the relationship being roughly linear with constant spread). It uses the actual data values, not their ranks, and its strength is highest when the relationship is linear and the data meet those distributional assumptions. Spearman, on the other hand, is non-parametric and uses the ranks of the data. It assesses monotonic relationships, where as one variable increases, the other tends to increase or decrease, but not necessarily at a constant linear rate. Because it works with ranks, it can be used with ordinal data or with continuous data that aren't normally distributed, and it's more robust to outliers. So the best description is that Pearson is parametric and evaluates linear relationships on continuous, normally distributed data, while Spearman is non-parametric and uses ranks to assess monotonic relationships. Correlation does not imply causation.

4. **The Kruskal-Wallis test is a non-parametric method for comparing three or more what?**

   A. **Means**

   B. **Medians**

   C. **Variances**

   D. **Proportions**

Kruskal-Wallis is a nonparametric method used to compare three or more independent groups to see if their central tendency differs. It works by ranking all the data across groups and testing whether those ranks come from the same distribution, which, when group shapes are similar, is interpreted as differences in central tendency. This makes it the nonparametric counterpart to ANOVA, which targets means in the parametric setting; using ranks allows the test to avoid normality assumptions. Among the options, this test is about central tendency across multiple groups, which is why it's described as comparing means in many contexts. It does not directly focus on variances or proportions, and it isn't a test for those aspects.

5. The MMT rating system is an example of which data type?

A. Nominal data

B. Ordinal data

C. Interval data

D. Ratio data

The main idea is that this rating system places muscle strength on a ranked scale, where higher numbers mean more strength, but the gaps between numbers aren't assumed to be equal. That means you can tell which strength level is higher, but you can't quantify exactly how much stronger one level is than the next. Ordinal data are data that are ordered: you know the sequence from low to high, but the differences between adjacent levels aren't necessarily uniform. In contrast, nominal data have no inherent order (categories without ranking), interval data require equal intervals between values but have no true zero, and ratio data have equal intervals with a true zero. Since the MMT scale shows order without guaranteed equal spacing, it's best described as ordinal data.

6. The non-parametric test for comparing two independent groups is the Mann-Whitney U.

A. True

B. False

C. Not sure

D. Both

When you're comparing two independent groups and you can't rely on the data being normally distributed, the Mann-Whitney U test is the go-to non-parametric method. It doesn't require normality or equal variances and is suitable for ordinal data or continuous data with outliers that violate parametric assumptions. Conceptually, it asks whether the two groups tend to have different values, not by comparing means but by looking at the overall ordering of all observations. You replace each observation with its rank in the combined sample, then sum the ranks within each group. The resulting U statistic (and its distribution under the null hypothesis of identical distributions) tells you whether one group tends to yield higher values than the other. A significant result suggests a shift in the distribution between groups. It's also useful to know that this test is often called the Wilcoxon rank-sum test. If the data come from paired or matched observations, you'd use the Wilcoxon signed-rank test instead. And for more than two groups, you'd turn to the Kruskal-Wallis test, which is a generalization of this non-parametric approach. In short, the statement is correct because Mann-Whitney U is the standard non-parametric method for comparing two independent groups when normality cannot be assumed.

7. What can a correlation analyze and what are its limitations?

A. It analyzes causation; not sensitive to outliers.

B. It analyzes strength and direction of association but cannot determine causation; sensitive to outliers; only measures linear relationships; third variables may influence results.

C. It proves a causal link.

D. It analyzes only mean differences.

Correlation examines how two variables move together, capturing both the direction (positive or negative) and the strength of their association. It does not establish causation—finding a strong relationship does not prove that one variable causes changes in the other. This is a key limitation: there can be a third variable driving both, or the relationship could be due to reverse causation or chance. Outliers can have a big impact on the correlation value, potentially exaggerating or masking the true relationship. Also, correlation primarily measures linear relationships; if the association is curved or otherwise non-linear, the correlation may be weak even though there is a meaningful relationship. Finally, the presence of confounding factors can distort the observed association, so correlation alone isn't enough to infer a causal link. In short, correlation tells you how strongly and in what direction two variables relate, but it doesn't prove causation, is sensitive to outliers, mostly detects linear patterns, and can be influenced by third variables.

8. What is Type I error?

A. Failing to detect a real effect

B. Detecting an effect when none exists

C. Biased estimate of the mean

D. Random sampling error

Type I error is a false positive in hypothesis testing: you conclude there is an effect when there actually isn't one. This happens when you reject the null hypothesis even though it is true. The chance of making this error is the alpha level you set (often 0.05). For example, you might conclude a new drug works when it doesn't. This isn't the same as failing to detect a real effect (that's a Type II error), nor is it about a biased estimate of the mean or about random sampling error, which are different issues related to estimation or variability rather than the decision rule about the null hypothesis.

9. If p = 0.18, which interpretation is correct?

A. There is an 18% probability that differences are due to chance

B. The results are statistically significant

C. The null hypothesis is false with 18% certainty

D. The study has 18% power

The main idea here is how to interpret a p-value. A p-value of 0.18 means that, if there were really no difference (the null hypothesis is true), there is about an 18% chance of obtaining results as extreme as the ones observed. In other words, the data are not highly incompatible with the null, so the observed differences could arise by random sampling alone, about 18% of the time. This interpretation focuses on what the p-value says about the data under the null, not on the probability that the null is true or false in the population, nor on the study's power. That's why the statement about an 18% probability that the differences are due to chance is the best fit. It's also why the other options aren't correct: a p-value of 0.18 does not by itself declare significance, it does not give the probability that the null is false, and it does not reflect the study's power.

10. What does a p-value represent?

A. Probability of obtaining the observed results if the null hypothesis is true

B. Probability that the null hypothesis is true

C. Probability that the alternative hypothesis is true

D. Probability of sampling error

The p-value tells you how compatible the observed data are with the assumption that the null hypothesis is true. It is the probability, under that assumption, of obtaining the observed result or something as or more extreme in the direction of interest. In a two-sided test, this means extreme in either direction. It is a conditional probability of the data given the null hypothesis (P(data or more extreme | H0)), not the probability that the null itself is true (that would be a Bayesian idea) and not the probability that the alternative is true. It also isn't a direct measure of sampling error. A small p-value suggests the data are unlikely under the null and leads to rejecting it at your chosen significance level, while a large p-value indicates the data are reasonably consistent with the null.

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:

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