TASK GROUP 142 TOLERANCES PRACTICE TEST (SAMPLE)

STUDY GUIDE



SAMPLE STUDY GUIDE WITH LIMITED QUESTIONS

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Table of Contents

Copyright 1

Table of Contents 2

Introduction 3

How to Use This Guide 4

Questions 5

Answers 8

Explanations 10

Next Steps 15

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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.

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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!

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Questions

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1. How does a projected tolerance zone affect assembly clearance?

A. It ensures the projected portion of the feature will have tolerance relative to the mating part at the projection height.

B. It eliminates the need for datum references.

C. It fixes the position of the hole regardless of assembly.

D. It reduces the tolerance zone to zero.

2. In respiratory gating, the annual dose delivery accuracy tolerance is best described as within MU of the expected delivery?

A. Within 50 MU of expected

B. Within 100 MU of expected

C. Within 150 MU of expected

D. Within 200 MU of expected

3. How do you interpret a dimension labeled Ø0.010 in GD&T?

A. The feature must be a cylinder with 0.010 height.

B. The surface is within flatness 0.010.

C. The feature is located within 0.010 from datum.

D. The feature has a cylindrical tolerance zone around its axis with diameter 0.010.

4. What is the annual X-ray flatness change from baseline tolerance?

A. 1%

B. 2%

C. Functional

D. ±1 mm

5. Which tolerance describes the arc mode allowance in MU per degree?

A. ±0.5% from baseline

B. ±2% from baseline

C. Functional

D. ±1% from baseline

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6. How is the height of a projected tolerance zone specified?

A. In the datum references.

B. In the callout as the projection height.

C. In the material specification.

D. In the production process note.

7. What is the annual spot check of field size dependent output factors tolerance?

A. ±1% from baseline

B. ±2% from baseline

C. ±3% from baseline

D. ±5% from baseline

8. What is the monthly gantry/collimator angle indicator tolerance?

A. 0.5°

B. 2°

C. 1.5°

D. 1°

9. What is the significance of the "remainder of the surface is free of tolerances"?

A. It means tolerance only applies to specified features; other surface areas are unconstrained.

B. It means all surfaces must still satisfy the same tolerances.

C. There is no need to measure the remainder surface.

D. The remainder defines default datum.

10. Which of the following describes the CT number accuracy tolerance for water-equivalent materials?

A. ±1 Hu

B. ±3 Hu

C. ±4 Hu

D. ±5 Hu

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Answers

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

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Explanations

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1. How does a projected tolerance zone affect assembly clearance?

A. It ensures the projected portion of the feature will have tolerance relative to the mating part at the projection height.

B. It eliminates the need for datum references.

C. It fixes the position of the hole regardless of assembly.

D. It reduces the tolerance zone to zero.

A projected tolerance zone is about extending the controlled area of a feature beyond the surface so the tolerance applies at the depth where the mating part actually engages. When you project the tolerance zone, you specify a height, and the position (or other) tolerance is measured at that projection. This means the part must be within tolerance not just at the feature's surface, but at the height where the mating part will interact, ensuring there's enough clearance for assembly even if there are variation along that depth. In practice, this helps prevent interference from misalignment or part variation at the engagement depth, which is critical when studs, pins, or protruding features enter a hole or mate with another feature. The projected zone doesn't erase datum references or fix the hole's location regardless of assembly, and it doesn't reduce the tolerance to zero—the tolerance is simply extended along the projection height to match the actual assembly condition.

2. In respiratory gating, the annual dose delivery accuracy tolerance is best described as within MU of the expected delivery?

A. Within 50 MU of expected

B. Within 100 MU of expected

C. Within 150 MU of expected

D. Within 200 MU of expected

In respiratory gating, the annual dose delivery accuracy tolerance is expressed in monitor units because it measures how close the actual delivered dose (in MU) over the year is to what was planned. Gating adds variability from when the beam turns on and off with the patient's breathing, so using MU as the tolerance unit keeps the criterion tied directly to the delivered dose, regardless of how many MU a given plan uses. Choosing within 100 MU of the expected delivery provides a practical balance. It is tight enough to catch gradual drift in machine output or gating synchronization over the year, yet lenient enough to accommodate day-to-day fluctuations that come with gated deliveries. For typical plans, this amounts to only a small, clinically acceptable deviation in total annual dose. A smaller tolerance like 50 MU would be overly sensitive to normal variations, while larger tolerances such as 150 or 200 MU could allow meaningful drift to go unnoticed.

3. How do you interpret a dimension labeled Ø0.010 in GD&T?

A. The feature must be a cylinder with 0.010 height.

B. The surface is within flatness 0.010.

C. The feature is located within 0.010 from datum.

D. The feature has a cylindrical tolerance zone around its axis with diameter 0.010.

In GD&T, the diameter symbol before a size signals a cylindrical tolerance zone around the feature's axis. A value of 0.010 means that the tolerance zone is a cylinder with a diameter of 0.010, coaxial with the feature's axis. The surface of the feature must lie within that cylinder, so the axis can wander but the surface must stay within 0.005 on either side of the true axis. This interpretation governs form or runout aspects that use a cylindrical zone, not height, flatness, or positional distance from a datum. The other options pull in concepts (height, flatness, location) that aren't defined by a Ø dimension alone.

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4. What is the annual X-ray flatness change from baseline tolerance?

A. 1%

B. 2%

C. Functional

D. ±1 mm

Beam flatness measures how uniform the X-ray field is across the image, expressed as a percentage difference from the baseline beam profile. For annual quality checks, the tolerance is kept tight to preserve accurate dose delivery and consistent image quality over the year. The standard value is 1 percent, meaning the maximum change from the baseline across the field should not exceed 1%. A 2 percent change would indicate a larger deviation than normally allowed for an annual tolerance. A measurement described as ±1 mm relates to geometry or alignment, not to flatness percentage, and a non-numeric option doesn't apply here. So the annual X-ray flatness change from baseline tolerance is 1%.

5. Which tolerance describes the arc mode allowance in MU per degree?

A. ±0.5% from baseline

B. ±2% from baseline

C. Functional

D. ±1% from baseline

In arc therapy, the beam is delivered as the gantry rotates, so the output per degree must stay tied to a steady baseline to keep the dose consistent around the arc. The tolerance for MU per degree in arc mode is ±1% of that baseline, meaning the MU per degree should stay within one percent above or below the baseline. For example, if the baseline is 5 MU per degree, the allowed range is 4.95 to 5.05 MU per degree. This keeps dose uniform despite the continuous rotation. The other options don't match the standard arc-mode allowance, and a non-numeric term isn't a tolerance.

6. How is the height of a projected tolerance zone specified?

A. In the datum references.

B. In the callout as the projection height.

C. In the material specification.

D. In the production process note.

The height of a projected tolerance zone is defined right in the feature control frame as the projection height. This value specifies how far the tolerance zone should extend above the part surface to simulate the actual engagement of a fastener or pin during assembly, ensuring the positional tolerance remains valid for the assembled condition. It's not determined by datums, material specifications, or production process notes. Those elements define references, materials, or manufacturing notes, but they don't set how far the zone projects.

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7. What is the annual spot check of field size dependent output factors tolerance?

A. ±1% from baseline

B. ±2% from baseline

C. ±3% from baseline

D. ±5% from baseline

Field size dependent output factors show how the machine's output changes as you change the field size. Over time, the beam can drift a little due to aging, energy changes, or calibration shifts, so you perform a spot check to verify those factors remain consistent with the baseline. The accepted annual tolerance is ±2% from that baseline, which is a practical balance between detecting meaningful drift and accommodating normal measurement variability with standard dosimetry equipment. If a measurement falls outside this window, recalibration or service is needed. For example, if a reference field size has an output factor of 1.00, the current value should be within 0.98 to 1.02. Tolerances tighter than this could be overly sensitive to noise, while looser tolerances could allow clinically significant dose differences to go unnoticed.

8. What is the monthly gantry/collimator angle indicator tolerance?

A. 0.5°

B. 2°

C. 1.5°

D. 1°

The monthly tolerance for the gantry and collimator angle indicators is 1 degree. This means the angle readout on the machine's display should match the actual physical angle within one degree during monthly QA checks. The purpose is to ensure the beam is delivered with the intended orientation, since even small angular errors can affect dose distribution, especially in complex setups or arc treatments. TG-142 sets this tolerance at about 1° because it reflects a practical balance: it's tight enough to catch drift or miscalibration that could impact treatment accuracy, but not so strict that it makes routine QA overly burdensome or unrealistic given the mechanical precision of standard equipment. If the measured difference is greater than 1°, the system should be recalibrated or serviced. Other tighter or looser numbers would either impose unnecessary QA burden (0.5°) or risk larger misalignments in delivery (1.5° or 2°).

9. What is the significance of the "remainder of the surface is free of tolerances"?

A. It means tolerance only applies to specified features; other surface areas are unconstrained.

B. It means all surfaces must still satisfy the same tolerances.

C. There is no need to measure the remainder surface.

D. The remainder defines default datum.

In GD&T, tolerances are applied only to the surfaces or features that are specifically designated on the drawing. If the remainder of a surface is free of tolerances, that means those other areas are not constrained by the stated tolerances and can vary without affecting whether the part passes or fails for those tolerances. This focuses control on the critical features while not imposing limits on every part of the surface. It does not imply that all surfaces must meet the same tolerances, nor does it imply you can ignore measurement entirely or that the remainder automatically defines a default datum.

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10. Which of the following describes the CT number accuracy tolerance for water-equivalent materials?

A. ±1 Hu

B. ±3 Hu

C. ±4 Hu

D. ±5 Hu

In CT QA, you evaluate how close the measured CT numbers are to the expected values. Water is defined as 0 HU, and materials that are designed to be water-equivalent should also appear near 0 HU. Because scanners vary a bit in calibration, reconstruction, and setup, a small allowance is allowed. The standard tolerance for water-equivalent materials is ±5 HU, meaning measurements between -5 and +5 HU are acceptable. Tolerances like ±1, ±3, or ±4 HU are too stringent given typical system variability, so they aren't used as the standard. If a measured value falls outside ±5 HU, it indicates a drift or discrepancy that could affect accurate electron density mapping for planning.

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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://tg142tolerances.examzify.com

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

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