DAY 2002A LIMITS PRACTICE TEST (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.

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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. Evaluate lim_{x->0} (1 - cos x)/x^2.

A. 0

B. 1/2

C. 1

D. -1/2

2. For a rational function where the degree of the numerator equals the degree of the denominator, the horizontal asymptote is given by:

A. The ratio of the leading coefficients

B. y = 0

C. No horizontal asymptote

D. The slope of the oblique asymptote

3. For f(x)=(x^2-4)/(x-2), x != 2, what is lim x->2 f(x)?

A. 0

B. 4

C. -4

D. Infinity

4. What is the N2 transient value at 10 seconds?

A. 108% (10 sec)

B. 103% (10 sec)

C. 860 °C (5 sec)

D. 755 °C max

5. Determine the left-hand limit of |x|/x as x approaches 0.

A. -1

B. 0

C. 1

D. Infinity

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6. According to ITT note #1, a linear variation applies above which temperatures for ten seconds and two seconds respectively?

A. 980-1090 °C (2 sec); 1090 °C max

B. 755-810 °C; 810 °C max

C. 860 °C (5 sec)

D. 870 °C; 980 °C

7. What is the continuous operation range for transmission oil pressure?

A. 30-50 psi

B. 25-55 psi

C. 35-60 psi

D. 30-55 psi

8. Evaluate lim_{x->π/4} (tan x - 1)/(x - π/4).

A. 0

B. 1

C. 2

D. -2

9. Evaluate the limit as x approaches 1 of (x^2 - 1)/(x - 1).

A. 1

B. 2

C. 0

D. -2

10. During operation with N1 < 72%, engine oil pressure range?

A. 0-40 psi

B. 40-80 psi (with N1 < 72%)

C. 80-110 psi

D. 40-60 psi

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Answers

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

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Explanations

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1. Evaluate lim_{x->0} (1 - cos x)/x^2.

A. 0

B. 1/2

C. 1

D. -1/2

Cosine behaves like 1 minus a quadratic term for small angles, so cos x ≈ 1 − x^2/2 as x 0. That means 1 − cos x ≈ x^2/2, and dividing by x^2 leaves 1/2 in the limit. A clean way to see this uses the identity 1 − cos x = 2 sin^2(x/2): (1 − cos x)/x^2 = (1/2)[sin(x/2)/(x/2)]^2, and since sin t/t 1 as t 0, the limit is 1/2.

2. For a rational function where the degree of the numerator equals the degree of the denominator, the horizontal asymptote is given by:

A. The ratio of the leading coefficients

B. y = 0

C. No horizontal asymptote

D. The slope of the oblique asymptote

When the degrees of the numerator and denominator are the same, the dominant terms in the rational function determine its end behavior. As x grows large in magnitude, the lower-degree terms become insignificant, so the function behaves like the ratio of the leading terms. That means the horizontal asymptote is the constant you get by dividing the leading coefficient of the numerator by the leading coefficient of the denominator. For instance, f(x) = (3x + 2)/(2x − 5) approaches 3/2 as x ±∞, so y = 3/2 is the horizontal asymptote. The other scenarios don't apply here: y = 0 would require the numerator to have lower degree than the denominator; no horizontal asymptote would occur if the numerator's degree were higher; and an oblique (sloped) asymptote happens when the numerator's degree is exactly one more than the denominator's, not when they're equal.

3. For f(x)=(x^2-4)/(x-2), x != 2, what is lim x->2 f(x)?

A. 0

B. 4

C. -4

D. Infinity

When a limit is asked for a rational expression with a hole, look for a removable discontinuity. Here the numerator x^2−4 factors as (x−2)(x+2). The (x−2) factor cancels with the denominator, leaving x+2 for x ≠ 2. So as x approaches 2, the function behaves like x+2, which tends to 4. Therefore the limit is 4. This is a removable discontinuity at x=2, since you'd get continuity if you defined f(2)=4. The other values would require different near-2 behavior, but cancellation shows the limit is 4.

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4. What is the N2 transient value at 10 seconds?

A. 108% (10 sec)

B. 103% (10 sec)

C. 860 °C (5 sec)

D. 755 °C max

During transients, the permissible N2 value is given as a percentage of the reference N2, showing how far the high-pressure spool can overshoot during a dynamic change. For a 10-second transient, the allowable N2 is 108% of the reference N2. This is the appropriate reading because the question asks for the N2 transient value, which is a speed percentage, not a temperature. The other options present temperatures (860 °C or 755 °C), which relate to EGT or max IT, not the transient N2 limit. Therefore, 108% at 10 seconds is the correct choice.

5. Determine the left-hand limit of |x|/x as x approaches 0.

A. -1

B. 0

C. 1

D. Infinity

Think about the sign of x when you're approaching 0 from the left. If x is negative, then |x| = -x. So |x|/x = (-x)/x = -1 for every x < 0. As x gets closer to 0 from the left, this value stays at -1, so the left-hand limit is -1. (From the right, it would be +1, since then |x| = x and |x|/x = 1, so the two one-sided limits differ.) The function isn't defined at 0, which is why we talk about one-sided limits rather than a single limit.

6. According to ITT note #1, a linear variation applies above which temperatures for ten seconds and two seconds respectively?

A. 980-1090 °C (2 sec); 1090 °C max

B. 755-810 °C; 810 °C max

C. 860 °C (5 sec)

D. 870 °C; 980 °C

The question tests the two-threshold timing concept: there are two temperature points where a linear variation applies, each with its own exposure time. The first threshold is 870 °C and must be held for ten seconds, and the second threshold is 980 °C and must be held for two seconds. The option that lists 870 °C and 980 °C in the order corresponding to ten seconds and two seconds matches this two-tier requirement from ITT note #1, so it aligns with the given timings exactly. Other options propose different temperatures, ranges, or a single threshold, which don't fit the described two-step timing pattern.

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7. What is the continuous operation range for transmission oil pressure?

A. 30-50 psi

B. 25-55 psi

C. 35-60 psi

D. 30-55 psi

The continuous operation range being tested is the stable band in which transmission oil pressure stays during normal, steady operation. In hydraulic transmissions, oil pressure powers the clutches and bands, so it must be high enough to reliably engage these components but not so high that it causes excessive wear or overheating. Under typical conditions, the pressure sits around 30 psi at lower speeds and climbs toward the mid-50s psi as RPM increases. If the pressure stays consistently below about 30 psi, the hydraulic circuits may not engage properly, leading to slippage or delayed shifts. If it stays above about 55 psi for extended periods, seals and valve train can wear faster and heat buildup can occur. Brief spikes during shifting can exceed the normal range, but the continuous operating range refers to the steady, sustained pressure level. Among the given options, 30-55 psi best matches this continuous operating window, representing the normal, safe range for steady transmission operation.

8. Evaluate lim_{x->π/4} (tan x - 1)/(x - π/4).

A. 0

B. 1

C. 2

D. -2

This is the difference quotient for tan x at the point x = π/4. In other words, it's the derivative of tan at a = π/4. Since the derivative of tan x is sec^2 x, evaluate at π/4: sec^2(π/4) = 1/cos^2(π/4) = 1/(√2/2)^2 = 2. So the limit is 2. An alternative view uses the identity tan x − tan a = sin(x − a)/(cos x cos a). Then the expression becomes sin(x − a)/[(x − a) cos x cos a], which tends to 1/(cos a cos a) = 1/cos^2 a = 2 as x a.

9. Evaluate the limit as x approaches 1 of (x^2 - 1)/(x - 1).

A. 1

B. 2

C. 0

D. -2

When a limit presents what looks like an indeterminate 0/0 form, look for algebraic simplifications that remove the troublesome factor. Here the numerator factors as x^2 - 1 = (x - 1)(x + 1). For x not equal to 1, the expression simplifies to (x - 1)(x + 1)/(x - 1) = x + 1. So as x approaches 1, the expression behaves like x + 1 and tends to 2. Therefore, the limit is 2. The original expression isn't defined at x = 1, but the limit uses values near 1, where the simplified form applies.

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10. During operation with N1 < 72%, engine oil pressure range?

A. 0-40 psi

B. 40-80 psi (with N1 < 72%)

C. 80-110 psi

D. 40-60 psi

Oil pressure tracks how hard the engine is working: as N1 increases, the oil pump tends to push more oil and the pressure rises, up to a limit. When N1 is below 72%, the engine is not demanding maximum pump output, so the lubrication system is expected to operate within a mid-range pressure that's high enough to keep the bearings sprayed with oil but not so high as to over-pressurize the system. That's why the 40 to 80 psi band is the correct range. The other options either would leave too little pressure for safe lubrication at this speed, or would indicate abnormally high pressure for a low-N1 condition, or narrow the range to a value that doesn't reflect the full acceptable band at this operating point.

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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://day2002alimits.examzify.com

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

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