

ENGINEERING DISCIPLINE PRACTICE TEST (SAMPLE)

STUDY GUIDE



**SAMPLE STUDY GUIDE
WITH LIMITED QUESTIONS**

**VISIT US ONLINE FOR
THE FULL VERSION STUDY GUIDE**

<https://engineeringdiscipline.examzify.com>



Copyright © 2026 by Examzify - A Kaluba Technologies Inc. product.

ALL RIGHTS RESERVED.

No part of this book may be reproduced or transferred in any form or by any means, graphic, electronic, or mechanical, including photocopying, recording, web distribution, taping, or by any information storage retrieval system, without the written permission of the author.

Notice: Examzify makes every reasonable effort to obtain accurate, complete, and timely information about this product from reliable sources.

SAMPLE

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

SAMPLE

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

SAMPLE

- 1. Which statement best distinguishes yield strength from ultimate tensile strength in a material?**
 - A. Yield strength is the stress at which plastic deformation begins; UTS is the maximum stress the material can withstand before fracture
 - B. Yield strength is the maximum stress before fracture; UTS is the stress where plastic deformation begins
 - C. Yield strength measures hardness; UTS measures ductility
 - D. Yield strength equals fracture strength
- 2. In engineering terminology, CAC stands for what?**
 - A. Computer-Aided Manufacturing
 - B. Computer-Assisted Computing
 - C. Computer-Aided Construction
 - D. Computer-Aided Designing
- 3. Carnot efficiency for a heat engine operating between temperatures T_h and T_c is given by which expression?**
 - A. $\eta = T_h/T_c$
 - B. $\eta = 1 - T_c/T_h$
 - C. $\eta = (T_h - T_c)/T_c$
 - D. $\eta = 1 - T_h/T_c$
- 4. What classes will a chemical engineer need to take in college?**
 - A. Fluid mechanics
 - B. Thermodynamics
 - C. Mass transfer operation
 - D. Electrical circuits
- 5. If the Hessian is indefinite at a critical point, what does that imply about the point?**
 - A. The point is a saddle point.
 - B. The point is a local minimum.
 - C. The point is a local maximum.
 - D. The point is inconclusive.

6. Which term best describes a chip designed to handle processing tasks inside a larger device?
- A. RAM module
 - B. Power supply
 - C. Microprocessor
 - D. Wireless adapter
7. In a resistor network, apply Kirchhoff's Current Law at a node with currents i_1 , i_2 , i_3 ; what is the relation?
- A. $i_1 + i_2 + i_3 = 0$
 - B. $i_1 + i_2 = i_3$
 - C. $i_1 i_2 i_3 = 0$
 - D. $i_1 = i_2 = i_3$
8. If the eigenvalues of a matrix are 3 and 1, what is the determinant of the matrix?
- A. 3
 - B. 2
 - C. 4
 - D. 1
9. Given a resistor with current $I = 2 \text{ A}$ and resistance $R = 5 \Omega$, what is the voltage across it?
- A. 10 V
 - B. 7 V
 - C. 3 V
 - D. 15 V
10. In an RL circuit subjected to a step input with zero initial current, which expression correctly describes the current $i(t)$ and the time constant τ ?
- A. $i(t) = (V/R) e^{-t R / L}$; $\tau = L / R$
 - B. $i(t) = (V/R) (1 - e^{-t R / L})$; $\tau = L / R$
 - C. $i(t) = (V/R) (1 - e^{-t L / R})$; $\tau = L / R$
 - D. $i(t) = (V/R) (1 - e^{-t / (L / R)})$; $\tau = L / R$

Answers

SAMPLE

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

SAMPLE

Explanations

SAMPLE

1. Which statement best distinguishes yield strength from ultimate tensile strength in a material?

A. Yield strength is the stress at which plastic deformation begins; UTS is the maximum stress the material can withstand before fracture

B. Yield strength is the maximum stress before fracture; UTS is the stress where plastic deformation begins

C. Yield strength measures hardness; UTS measures ductility

D. Yield strength equals fracture strength

Yield strength marks the stress where a material stops behaving elastically and begins to deform plastically, meaning permanent deformation remains after unloading. Ultimate tensile strength is the highest stress the material can withstand in a tensile test, occurring at the peak of the engineering stress-strain curve and typically just before necking and eventual fracture. So this distinction is about elastic versus plastic behavior versus the maximum load-bearing capacity before failure. In other words, yield strength tells you when deformation becomes permanent, while ultimate tensile strength tells you the maximum load the part can carry before it fails. Some materials don't have a clear yield point, so engineers use an offset yield (such as 0.2%) to define yield strength.

2. In engineering terminology, CAC stands for what?

A. Computer-Aided Manufacturing

B. Computer-Assisted Computing

C. Computer-Aided Construction

D. Computer-Aided Designing

The idea being tested is how acronyms map to the terms they describe when using computer tools in engineering. CAC here is interpreted as combining "Computer" with "Aided" and a design-related activity, giving Computer-Aided Designing. The computer aids the designer in creating plans, drawings, and specifications, which is the core function of design work in engineering workflows. This aligns with the concept of using software on a computer to support design tasks, rather than manufacturing or construction processes. While the more common term in practice is Computer-Aided Design, CAC matches the letter-for-word expansion to include Designing, distinguishing it from options that would map to manufacturing or construction or use different wording like "assisted."

3. Carnot efficiency for a heat engine operating between temperatures T_h and T_c is given by which expression?

A. $\eta = T_h/T_c$

B. $\eta = 1 - T_c/T_h$

C. $\eta = (T_h - T_c)/T_c$

D. $\eta = 1 - T_h/T_c$

Carnot efficiency is the maximum possible efficiency for a heat engine operating between two thermal reservoirs, and it depends only on the temperatures of those reservoirs expressed in absolute units. For a reversible (Carnot) cycle, the heat exchanged with the hot and cold reservoirs satisfies $Q_c/Q_h = T_c/T_h$, so the work produced is $W = Q_h - Q_c$ and the efficiency $\eta = W/Q_h = 1 - Q_c/Q_h$. Substituting Q_c/Q_h with T_c/T_h gives $\eta = 1 - T_c/T_h$. This shows that efficiency increases as the hot temperature rises or the cold temperature falls, and it cannot exceed 1. Expressions that place T_h in the numerator or otherwise misorder the ratio do not reflect the correct thermodynamic relationship for a Carnot engine.

4. What classes will a chemical engineer need to take in college?

- A. Fluid mechanics
- B. Thermodynamics
- C. Mass transfer operation**
- D. Electrical circuits

Mass transfer operation focuses on how chemical species move between phases and through contact interfaces, which is central to designing many chemical processes. This class covers diffusion, phase equilibria, and the rate-limiting steps that govern separation, purification, and reaction system performance. In practice, engineers size and select equipment like distillation columns, absorbers, extractors, and membranes based on mass transfer principles, making it a defining part of chemical engineering training. While fluid mechanics and thermodynamics are essential foundations for predicting flow and energy changes, mass transfer operations specifically address the separation steps that are ubiquitous in industry. Electrical circuits, while important in other fields, are not a core focus of chemical engineering curricula.

5. If the Hessian is indefinite at a critical point, what does that imply about the point?

- A. The point is a saddle point.**
- B. The point is a local minimum.
- C. The point is a local maximum.
- D. The point is inconclusive.

The key idea is that the Hessian tells you how the function curves in different directions around a critical point. When the gradient is zero, you look at the Hessian to see whether curvature is all in one direction (up or down) or in a mix of directions. If the Hessian is indefinite, it means the quadratic form it defines takes both positive and negative values as you move in different directions away from the point. In some directions the function curves upward (positive curvature), and in others it curves downward (negative curvature). This mixed curvature means the point cannot be a local minimum or a local maximum. Instead, you have a saddle point: the function increases in some directions and decreases in others around that location. A quick example is $f(x,y) = x^2 - y^2$, whose Hessian at $(0,0)$ has one positive and one negative eigenvalue, and indeed $(0,0)$ is a saddle.

6. Which term best describes a chip designed to handle processing tasks inside a larger device?

- A. RAM module
- B. Power supply
- C. Microprocessor**
- D. Wireless adapter

The main idea is identifying the component that actually executes instructions and performs computations inside a device. A microprocessor is that single-chip brain, designed to handle processing tasks, run software, and manage data flow within a larger system. It carries out arithmetic and logic operations and coordinates how other components work together. RAM, by contrast, is fast memory used to store data and instructions temporarily while programs run, not to perform processing itself. A power supply simply delivers electrical power to all parts of the device. A wireless adapter enables network communication, not core processing. So, the chip described as handling processing tasks inside a larger device is the microprocessor.

7. In a resistor network, apply Kirchhoff's Current Law at a node with currents i_1 , i_2 , i_3 ; what is the relation?

A. $i_1 + i_2 + i_3 = 0$

B. $i_1 + i_2 = i_3$

C. $i_1 i_2 i_3 = 0$

D. $i_1 = i_2 = i_3$

At a node, currents must balance: the total current entering equals the total current leaving. If you assign a consistent sign to each current based on its actual direction, the algebraic sum of the currents at the node is zero. That makes the relation $i_1 + i_2 + i_3 = 0$ the correct description of Kirchhoff's Current Law for this setup, because it encodes that balance regardless of how large each branch current is or which way it's flowing. The other forms aren't general statements of this balance. $i_1 + i_2 = i_3$ would only hold if you adopt a specific sign convention where i_3 represents the net current leaving that exactly matches the sum entering, which is not the universal form. The product and the idea that all three currents must be equal don't reflect the node balance principle.

8. If the eigenvalues of a matrix are 3 and 1, what is the determinant of the matrix?

A. 3

B. 2

C. 4

D. 1

The determinant equals the product of the eigenvalues, counting multiplicities. With eigenvalues 3 and 1, multiply them: $3 \times 1 = 3$. So the determinant is 3. This relationship holds for any square matrix, since the determinant equals the product of its eigenvalues.

9. Given a resistor with current $I = 2$ A and resistance $R = 5 \Omega$, what is the voltage across it?

A. 10 V

B. 7 V

C. 3 V

D. 15 V

Ohm's law says the voltage across a resistor is the product of the current through it and its resistance: $V = I \times R$. With $I = 2$ A and $R = 5 \Omega$, $V = 2 \times 5 = 10$ volts. The units work out because ampere times ohm equals volt. So the voltage across the resistor is 10 V. The other numbers would require different current or resistance to produce their values.

10. In an RL circuit subjected to a step input with zero initial current, which expression correctly describes the current $i(t)$ and the time constant τ ?

A. $i(t) = (V/R) e^{-t R / L}$; $\tau = L / R$

B. $i(t) = (V/R) (1 - e^{-t R / L})$; $\tau = L / R$

C. $i(t) = (V/R) (1 - e^{-t L / R})$; $\tau = L / R$

D. $i(t) = (V/R) (1 - e^{-t / (L / R)})$; $\tau = L / R$

When a step voltage is applied to a series RL circuit, the current rises from zero toward a final steady value set by Ohm's law for the DC case. The relationship is governed by the loop equation $V = iR + L di/dt$. Rewriting gives $L di/dt + Ri = V$, and with $i(0) = 0$ the solution shows the current approaching V/R exponentially. The time constant that controls this rate is $\tau = L/R$, so the current can be written as $i(t) = (V/R) [1 - e^{-(t/\tau)}] = (V/R) [1 - e^{(-tR/L)}]$. This form ensures $i(0) = 0$ and $i(\infty) = V/R$. The exponential decay term $e^{(-tR/L)}$ (or equivalently $e^{(-t/\tau)}$) captures how quickly the inductor stops opposing the change as the circuit settles, with larger L or smaller R yielding a slower rise.

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://engineeringdiscipline.examzify.com>

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

SAMPLE