WJEC LEVEL 1 AND 2 ENGINEERING – DESIGN, MANUFACTURE, AND PROBLEM SOLVING PRACTICE EXAM (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

1. Which term describes opposition to the flow of current in a circuit, measured in ohms?

A. Input

B. Resistance

C. Sensor

D. Process

2. How do you calculate the volume of a rectangular block?

A. Volume = Length × Width.

B. Volume = Length × Width × Height.

C. Volume = Height ÷ Density.

D. Volume = (Length × Width × Height) ÷ 2.

3. What is the purpose of a design brief in the engineering design process?

A. To identify the problem, state user needs, set scope and constraints, and guide development toward a suitable solution.

B. A set of manufacturing steps and production planning.

C. A marketing plan for product launch.

D. A description of legal compliance standards only.

4. Which describes a design for assembly (DFA) approach?

A. Designing products to maximize assembly steps

B. Creating products with many unique fasteners

C. Designing products to minimize assembly steps, reduce part count, and use standard fasteners

D. Not considering assembly during design

5. Define risk assessment in health and safety and list one method to reduce risk.

A. Identifying hazards, evaluating risk, and implementing controls; reduce risk via PPE, guards, training.

B. Ignoring risks to speed up production.

C. Only causes risk assessment after an incident.

D. Risk assessment is only about financial risk.

6. Which finish is noted for providing UV protection?

A. Paint (color and protection)

B. Lacquer (high gloss, thin film)

C. Wax or oil (surface feel and light protection)

D. Varnish (gloss and UV protection)

7. Which term describes evaluating hazards and implementing measures to ensure safety in the workplace?

A. Milling

B. Risk assessment

C. Anodising

D. Quality control

8. Which term refers to the stages a product goes through: raw material extraction, manufacture, distribution, use and disposal?

A. Design for recycling

B. Sustainability

C. Product life cycle

D. Ferrous metal

9. Which term describes evaluating environmental impact from production to end-of-life?

A. Market analysis

B. Lifecycle assessment

C. Risk assessment

D. Cost of goods sold

10. What is the purpose of a material properties table when selecting materials?

A. To compare properties (strength, hardness, density, cost) and choose a material that fits function and constraints.

B. To determine the color palette used in design.

C. To calculate machining time and production schedule.

D. To store supplier contact information for materials.

Answers

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

Explanations

1. Which term describes opposition to the flow of current in a circuit, measured in ohms?

A. Input

B. Resistance

C. Sensor

D. Process

Opposition to the flow of current in a circuit is called resistance, and it is measured in ohms. This quantity tells you how hard it is for electrical current to pass through a component. Ohm's law links these ideas: current equals voltage divided by resistance (I = V/R). So, for a given voltage, higher resistance reduces current, while lower resistance allows more current to flow. The ohm is the unit used for this opposition, reflecting how much the component resists the movement of electrons. In practical terms, a resistor is the component that provides this opposition. The other terms describe different ideas: an input is the signal or power that enters a system, a sensor is a device that detects a physical quantity, and a process is a series of actions or steps. None of these describe the circuit's opposition to current in the way resistance does.

2. How do you calculate the volume of a rectangular block?

A. Volume = Length × Width.

B. Volume = Length × Width × Height.

C. Volume = Height ÷ Density.

D. Volume = (Length × Width × Height) ÷ 2.

Volume is the amount of space inside a 3D shape. For a rectangular block, you can think of filling it with unit cubes: along the length you have L units, along the width W units, and along the height H units. The total number of unit cubes is L × W × H, so the volume is length × width × height. This multiplies all three dimensions to give the space inside. The other options mix up what you're counting (area instead of volume) or introduce division or density, which don't apply to this calculation.

3. What is the purpose of a design brief in the engineering design process?

A. To identify the problem, state user needs, set scope and constraints, and guide development toward a suitable solution.

B. A set of manufacturing steps and production planning.

C. A marketing plan for product launch.

D. A description of legal compliance standards only.

The main idea behind a design brief is to clearly define what needs to be solved and set the direction for the whole design effort. It identifies the problem, states what the user needs, and lays out the project scope and constraints such as size, cost, materials, safety, and performance. With these elements in place, the design team has a concrete target and a reference framework to guide concept generation, evaluation, and development, ensuring the final solution fits real user needs within the given limits. Other activities like manufacturing steps and production planning belong to later stages of the process, once a concept is chosen. A marketing plan focuses on how the product will be launched and sold, not on defining the problem or guiding design. Legal compliance is important, but it's part of the constraints rather than the core purpose of the brief.

4. Which describes a design for assembly (DFA) approach?

A. Designing products to maximize assembly steps

B. Creating products with many unique fasteners

C. Designing products to minimize assembly steps, reduce part count, and use standard fasteners

D. Not considering assembly during design

Design for assembly means shaping a product so it's quick and easy to put together in manufacturing. The core idea is to reduce the effort, time, and potential for error in assembling the product. This is best achieved by cutting the number of parts, so there's less handling and fewer steps, and by using standard fasteners that are readily available and simple to install. Designing parts to locate and fit together easily, sometimes with self-assembly features or modular subassemblies, also helps speed up production and reduce costs. In short, the aim is to minimize assembly steps, lower part count, and rely on standard fasteners to make the assembly process faster, cheaper, and less error-prone. The other options don't fit DFA philosophy because they either add complexity (more assembly steps, more unique fasteners) or ignore assembly considerations altogether, which would defeat the goal of making production efficient.

5. Define risk assessment in health and safety and list one method to reduce risk.

A. Identifying hazards, evaluating risk, and implementing controls; reduce risk via PPE, guards, training.

B. Ignoring risks to speed up production.

C. Only causes risk assessment after an incident.

D. Risk assessment is only about financial risk.

Risk assessment in health and safety is a systematic process: identify potential hazards, assess how likely harm is and how severe it could be, and decide on and put in place measures to control the risk so it is as low as reasonably practicable. A common way to reduce risk is to implement controls such as personal protective equipment, machine guards, and proper training so workers know how to perform tasks safely. This approach is proactive and helps prevent incidents before they happen. Choices that advocate ignoring risks, waiting until after an incident, or focusing only on financial risk don't build the protective framework that risk assessment is meant to create.

6. Which finish is noted for providing UV protection?

A. Paint (color and protection)

B. Lacquer (high gloss, thin film)

C. Wax or oil (surface feel and light protection)

D. Varnish (gloss and UV protection)

UV protection in finishes comes from forming a durable surface film that can block or absorb ultraviolet light. Varnish does exactly that: it cures into a hard, protective film on the surface, and many varnishes include UV inhibitors or blockers that help shield the material underneath from sun damage and fading. Wax or oil sits on the surface and wears away more quickly, offering only light protection. Paint provides color and general protection, but UV defense isn't its defining feature, and lacquer is a thin film that mainly adds gloss without inherent strong UV protection. So the finish noted for UV protection is varnish.

7. Which term describes evaluating hazards and implementing measures to ensure safety in the workplace?

A. Milling

B. Risk assessment

C. Anodising

D. Quality control

Risk assessment is the process of identifying hazards, deciding who might be harmed and how, evaluating the level of risk, and putting in place practical controls to reduce that risk. In engineering and the workplace, this means looking for dangers like moving parts, heat, chemicals, or high noise, and then choosing safeguards such as guards, ventilation, PPE, or safe procedures to prevent harm. This makes it the best match because it directly concerns evaluating hazards and implementing measures to keep people safe. The other terms refer to a machining process (milling), a surface treatment (anodising), or checking products against specifications (quality control), none of which focus on assessing safety hazards and applying protective actions.

8. Which term refers to the stages a product goes through: raw material extraction, manufacture, distribution, use and disposal?

A. Design for recycling

B. Sustainability

C. Product life cycle

D. Ferrous metal

Think about the entire journey of a product from start to finish: the extraction of raw materials, the manufacturing process, getting the product to markets, how it is used, and what happens at the end of its life. This full sequence is called the product life cycle. It's a framework used to study and plan the environmental, economic, and social impacts at each stage, helping designers and manufacturers make choices that reduce waste and conserve resources. The other ideas describe different things: design for recycling is about making products easier to recycle, sustainability is a broad aim to meet present needs without harming future generations, and ferrous metal is simply a type of iron-containing material. So the term that best fits the described stages is the product life cycle.

9. Which term describes evaluating environmental impact from production to end-of-life?

A. Market analysis

B. Lifecycle assessment

C. Risk assessment

D. Cost of goods sold

Evaluating environmental impact from production to end-of-life is done with a life cycle assessment. This approach inventories every stage the product goes through—from extracting raw materials and manufacturing to distribution, use, and end-of-life disposal or recycling—and measures associated inputs (like energy and materials) and outputs (such as emissions and waste). By quantifying these factors, it builds a picture of the product's overall environmental footprint and can compare different designs or options to identify where improvements reduce impact. Market analysis looks at demand, market size, and trends. Risk assessment examines potential hazards and their likelihood or severity. Cost of goods sold is an accounting measure of the direct costs tied to producing a product.

10. What is the purpose of a material properties table when selecting materials?

A. To compare properties (strength, hardness, density, cost) and choose a material that fits function and constraints.

B. To determine the color palette used in design.

C. To calculate machining time and production schedule.

D. To store supplier contact information for materials.

A material properties table is used to compare materials side by side so you can choose one that fits how the part will be used and the limits you're working within. By listing key characteristics—strength, hardness, density, stiffness, thermal and chemical resistance, cost, and sometimes manufacturability—you can judge which material will meet the required performance without over- or under-specifying. For example, a high-strength, lightweight part might require looking at strength-to-weight and density, along with cost, to decide between aluminum, steel, or composites, while also checking whether it will stand up to corrosion or heat in its service environment. Other options, like color choices, production timing, or supplier contacts, aren't determined by the properties table and belong to different parts of the design or planning process.

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://wjeclvl1and2engineering.examzify.com

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