ABSA 4TH CLASS POWER ENGINEER CERTIFICATE OF COMPETENCY – PART A 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.

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. **A lever is 3 m long with a load of 8,000 N suspended at 1 m from the pivot. What force is needed at the end to achieve equilibrium?**

   A. 2,666.667 N

   B. 1,333.333 N

   C. 16,000 N

   D. 24,000 N

2. **If 25 workers can complete a job in 30 days, how many days will it take 35 workers to complete the same job?**

   A. 20.00

   B. 18.00

   C. 20.25

   D. 21.43

3. **A simple machine is defined as one that receives energy from a single applied force and produces work by means of what?**

   A. Multiple output forces

   B. An energy form

   C. A single output force

   D. A mechanical device

4. **When water is turned into steam, which type of heat is involved?**

   A. Conduction heat

   B. Latent heat

   C. Sensible heat

   D. Specific heat

5. **What is the SI unit for weight?**

   A. kg

   B. lb

   C. kip

   D. Newton

6. Any material made up of distinct elements, compounds, or both, not chemically combined with each other represents

A. an atomic structure

B. a mixture

C. a molecule

D. a compound

7. How is power related to work and time?

A. Power = Work x Time

B. Power = Work / Time

C. Power = Work - Time

D. Power = Work + Time

8. A car travelling at 90 km/h is brought to rest over a distance of 120 m. What is the acceleration in metres per second squared?

A. 2.6

B. -2.6

C. 1.3

D. -1.3

9. What type of steam is fully saturated with both latent and sensible heat and contains no water particles?

A. Wet saturated steam

B. Dry saturated steam

C. Superheated steam

D. Sensibly heated steam

10. A cylindrical fuel tank with a diameter of 5 m and height of 15 m has a volume in litres of?

A. 294,525

B. 29,452.5

C. 2,945.25

D. 294.525

Answers

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

Explanations

1. A lever is 3 m long with a load of 8,000 N suspended at 1 m from the pivot. What force is needed at the end to achieve equilibrium?

A. 2,666.667 N

B. 1,333.333 N

C. 16,000 N

D. 24,000 N

To determine the force needed at the end of a 3 m long lever to achieve equilibrium, we can apply the principle of moments (or torque). In equilibrium, the clockwise moments about the pivot point must equal the counterclockwise moments. The load of 8,000 N is suspended 1 m from the pivot. Therefore, the moment created by the load can be calculated as: Moment from the load = Load × Distance from the pivot = 8,000 N × 1 m = 8,000 Nm. Next, if we denote the force at the end of the lever as F and the distance from the pivot to the end of the lever (which is 3 m), the moment created by this force would be: Moment from the force = F × 3 m. Setting the two moments equal to each other for equilibrium: 8,000 Nm = F × 3 m. To find F, we rearrange the equation: F = 8,000 Nm / 3 m = 2,666.667 N. This calculation shows that the force needed at the end of the lever to achieve equilibrium is indeed 2,666.667 N, confirming that this answer aligns with the principles of levers and

2. If 25 workers can complete a job in 30 days, how many days will it take 35 workers to complete the same job?

A. 20.00

B. 18.00

C. 20.25

D. 21.43

To determine how long it will take 35 workers to complete the same job that 25 workers can finish in 30 days, we first need to understand the relationship between workers, days, and the total work required. When 25 workers complete a job in 30 days, we can calculate the total work in worker-days. This is done by multiplying the number of workers by the number of days: Total work = Number of workers × Number of days Total work = 25 workers × 30 days = 750 worker-days. Now, if 35 workers are available, we need to find out how many days it will take them to accomplish the same total of 750 worker-days. We can set this up with the formula: Total work = Number of workers × Number of days 750 worker-days = 35 workers × Days To find the number of days, we rearrange the formula: Days = Total work / Number of workers Days = 750 worker-days / 35 workers Days = 21.42857 days. When we round this to two decimal places, we find that it is approximately 21.43 days. Therefore, the answer provided accurately reflects the calculations based on the initial total work and the

3. A simple machine is defined as one that receives energy from a single applied force and produces work by means of what?

A. Multiple output forces

B. An energy form

C. A single output force

D. A mechanical device

A simple machine is designed to amplify an applied force and make work easier, utilizing a single output force to accomplish this. When an input force is applied to the machine, it transforms that energy into work, producing a single output force that can be greater than the initial force applied. This principle allows for the efficiency of machines like levers, pulleys, and inclined planes, where the simple mechanics enable a significant output force from a single applied input. In context, while multiple output forces, different energy forms, and mechanical devices may pertain to various aspects of machines or energy transfer, they do not accurately define how a simple machine operates. The fundamental characteristic that defines a simple machine lies in its ability to produce a single, effectively leveraged output force from a singular input force. This streamlined mechanism exemplifies the essence of simple machines in physics and engineering contexts.

4. When water is turned into steam, which type of heat is involved?

A. Conduction heat

B. Latent heat

C. Sensible heat

D. Specific heat

The process of turning water into steam involves latent heat, which is the heat energy required for a phase change to occur without a change in temperature. When water is heated, it reaches a certain temperature (100 degrees Celsius at standard atmospheric pressure) where it begins to change from a liquid to a vapor. This specific heat energy added during this phase change does not raise the temperature of the water; instead, it is used to break the molecular bonds that hold the liquid together, allowing it to transition into steam. Sensible heat refers to the heat required to change the temperature of a substance without changing its phase. In this case, while heating water up to its boiling point involves sensible heat, the actual transformation from water to steam, the phase change, specifically utilizes latent heat. Thus, the term latent heat is essential in understanding this phase transition from liquid to gas.

5. What is the SI unit for weight?

A. kg

B. lb

C. kip

D. Newton

The SI unit for weight is the Newton. Weight is the force exerted by gravity on an object, and this force is measured in newtons in the International System of Units (SI). One newton is defined as the amount of force required to accelerate a one-kilogram mass by one meter per second squared. This relationship between force, mass, and acceleration is established by Newton's second law of motion, which states that force equals mass times acceleration (F=ma). Thus, it is clear that the newton serves as the appropriate unit for measuring weight since weight is a gravitational force. The other choices represent different concepts related to mass and weight but are not the SI unit for weight. Kilograms represent mass, pounds are a unit of weight used predominantly in the United States and not in the metric system, while a kip is a unit of force equal to 1,000 pounds-force, primarily used in structural engineering contexts.

6. Any material made up of distinct elements, compounds, or both, not chemically combined with each other represents

A. an atomic structure

B. a mixture

C. a molecule

D. a compound

The definition provided in the question accurately describes a mixture. A mixture consists of two or more substances—whether elements, compounds, or both—that are physically combined but not chemically bonded. This distinguishes a mixture from a compound, where the constituents undergo a chemical reaction to form a substance with new properties. For example, if sand and salt are mixed together, each retains its individual properties and can be separated through physical means, such as filtration or evaporation. In contrast, a compound, like water, is formed when hydrogen and oxygen chemically combine in a specific ratio, resulting in new characteristics that differ from those of the individual gases. The terminology in the other choices highlights specific concepts that do not align with the description in the question. An atomic structure pertains to the arrangement of atoms within a single element or compound, and a molecule refers to a group of atoms bonded together, often representing a single chemical species. Thus, while these concepts are related to the study of materials, they do not accurately fit the definition of distinct, non-chemically combined elements or compounds that characterize a mixture.

7. How is power related to work and time?

A. Power = Work x Time

B. Power = Work / Time

C. Power = Work - Time

D. Power = Work + Time

Power is defined as the rate at which work is done or energy is transferred over time. This relationship can be mathematically expressed with the equation Power = Work / Time. This means that if you perform a certain amount of work over a period of time, the power output is determined by dividing the total work done by the time taken to do it. For instance, if you lift a weight and it takes you a specific duration to lift it to a certain height, the work done against gravity (which is the force multiplied by the distance) divided by the time taken to perform that task gives you the power exerted during the lifting process. This relationship is critical in understanding how different machines and engines operate efficiently, and it highlights the importance of both the work done and the time required to complete it in calculating power. The other options suggest incorrect relationships that do not accurately define how power interacts with work and time, failing to capture the essence of this fundamental concept in physics and engineering.

8. A car travelling at 90 km/h is brought to rest over a distance of 120 m. What is the acceleration in metres per second squared?

A. 2.6

B. -2.6

C. 1.3

D. -1.3

To find the acceleration when a car is brought to rest, we can use the formula that relates acceleration, initial velocity, final velocity, and distance. The formula is: \[v^2 = u^2 + 2as \] Where: - \(v \) is the final velocity (0 m/s since the car comes to rest) - \(u \) is the initial velocity (90 km/h, which is converted to meters per second by using the conversion factor of 1 km/h = 1/3.6 m/s, resulting in 25 m/s) - \(a \) is the acceleration - \(s \) is the distance (120 m) Starting with the information, we can rearrange the equation to solve for acceleration \(a \): \[0 = (25)^2 + 2a(120) \] This simplifies to: \[0 = 625 + 240a \] From here, we can isolate \(a \): \[240a = -625 \] \[a = -\frac{625}{240} \] Calculating that gives \(a \approx -2.6 \) m/s². The negative sign indicates that the acceleration is

9. What type of steam is fully saturated with both latent and sensible heat and contains no water particles?

A. Wet saturated steam

B. Dry saturated steam

C. Superheated steam

D. Sensibly heated steam

Dry saturated steam is defined as steam that contains no water particles and is fully saturated with both latent and sensible heat. In the context of thermodynamic systems, when steam is at the saturation temperature corresponding to its pressure, it has reached a point where it has absorbed all the latent heat necessary for it to exist as a vapor, without any moisture or water droplets present. This makes it crucial in various engineering applications, as dry saturated steam provides maximum thermal energy for processes such as heating, power generation, and other industrial applications. The other types of steam mentioned have differing characteristics. Wet saturated steam contains both steam and water droplets, which means it carries less thermal energy compared to dry saturated steam. Superheated steam has been heated beyond the saturation temperature, which means it contains additional sensible heat but is not at the saturation point, potentially leading to a different thermodynamic behavior. Sensibly heated steam pertains to steam that has had heat added in a manner that raises its temperature without changing its phase, which is different from the completely saturated state defined by dry saturated steam.

10. A cylindrical fuel tank with a diameter of 5 m and height of 15 m has a volume in litres of?

A. 294,525

B. 29,452.5

C. 2,945.25

D. 294.525

To determine the volume of a cylindrical fuel tank, you can use the formula for the volume of a cylinder: \[V = \pi r^2 h \] where \(V \) is the volume, \(r \) is the radius, and \(h \) is the height of the cylinder. In this case, the diameter of the tank is given as 5 meters, which means the radius is half of that: \[r = \frac{5 \, \text{m}}{2} = 2.5 \, \text{m} \] The height \(h \) is provided as 15 meters. Now, substituting the values into the volume formula: \[V = \pi (2.5 \, \text{m})^2 (15 \, \text{m}) \] Calculating the radius squared: \[(2.5 \, \text{m})^2 = 6.25 \, \text{m}^2 \] Now, substituting back into the volume equation: \[V = \pi (6.25 \, \text{m}^2) (15 \, \text{m}) \]

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://absa4thclasspepta.examzify.com

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