

DUAL ENROLLMENT PHYSICAL SCIENCE MIDTERM 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

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1. Jet streams are high-velocity winds that occur in which part of the atmosphere?
 - A. Jet Streams
 - B. Trade Winds
 - C. Monsoons
 - D. Gulf Stream
2. The numbers in front of chemical formulas in a balanced equation are called
 - A. Subscripts
 - B. Molarities
 - C. Proportions
 - D. Coefficients
3. What is the sum of the atomic masses of all atoms in a compound as given in its chemical formula called?
 - A. Formula Mass
 - B. Atomic Mass
 - C. Law of Definite Composition
 - D. Octet Rule
4. A 0.50 mol sample of an ideal gas at 1.00 atm and 25°C occupies what volume? Use $R = 0.0821 \text{ L}\cdot\text{atm}/\text{mol}\cdot\text{K}$.
 - A. 12.23 L
 - B. 24.47 L
 - C. 6.02 L
 - D. 48.0 L
5. ____ are formed when air moves counterclockwise around a low pressure and clockwise around a high pressure.
 - A. Anticyclones
 - B. Cyclones
 - C. Tornadoes
 - D. Monsoons

6. If 3 moles of O_2 react according to $2 H_2 + O_2 \rightarrow 2 H_2O$, how many moles of H_2 are required?
- A. 3 moles
 - B. 1 mole
 - C. 6 moles
 - D. 9 moles
7. The period of a wave with a frequency of 60 Hz is approximately what?
- A. 0.0167 s
 - B. 0.6 s
 - C. 16.7 s
 - D. 0.00167 s
8. A light ray enters water ($n \approx 1.33$) from air ($n \approx 1.00$) at 30° . Using Snell's law, what is the refracted angle approximately?
- A. About 22.1°
 - B. About 12°
 - C. About 30°
 - D. About 45°
9. Which cloud type is listed as the first item in the cloud types list?
- A. Cirrus
 - B. Cumulus
 - C. Stratus
 - D. Nimbus
10. What is the third cloud type in the list?
- A. Cirrus
 - B. Cumulus
 - C. Stratus
 - D. Nimbus

Answers

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

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Explanations

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1. Jet streams are high-velocity winds that occur in which part of the atmosphere?

A. Jet Streams

B. Trade Winds

C. Monsoons

D. Gulf Stream

Jet streams are fast-moving air currents high in the atmosphere, located in the upper part of the troposphere right around the boundary with the stratosphere (the tropopause). They form where strong temperature differences between air masses meet and are sharpened by the Earth's rotation, so they tend to flow from west to east at mid-latitudes. They're not a surface feature; they lie several kilometers up and can influence weather patterns and flight paths. The other options refer to different phenomena: trade winds are steady winds near the equator in the lower atmosphere, monsoons describe seasonal shifts in winds and rainfall, and the Gulf Stream is an ocean current, not an atmospheric wind.

2. The numbers in front of chemical formulas in a balanced equation are called

A. Subscripts

B. Molarities

C. Proportions

D. Coefficients

These numbers are called coefficients. They sit in front of each chemical formula to show how many molecules (or moles) of that substance are involved in the reaction. When you balance an equation, you adjust these coefficients so that the same total number of atoms of every element appears on both sides of the arrow. That balance reflects the law of conservation of mass: nothing is created or destroyed, only rearranged into different substances. The coefficients multiply the entire formula, so they scale the entire molecule, not just parts of it. Subscripts, by contrast, are the small numbers inside a chemical formula that tell you how many atoms of each element are in a single molecule; those don't change during balancing. Molarities are about concentration, and proportions are general ratios, not the specific quantities used to balance an equation.

3. What is the sum of the atomic masses of all atoms in a compound as given in its chemical formula called?

A. Formula Mass

B. Atomic Mass

C. Law of Definite Composition

D. Octet Rule

Think of the chemical formula as a recipe that lists how many atoms of each element are in one formula unit. To find the total mass, multiply each element's atomic mass by how many atoms of that element are present, then add all those amounts together. That sum is called the formula mass. It represents the mass contributed by one formula unit in atomic mass units; if you convert to grams per mole, you're talking about the molar mass, which is numerically the same value. The other ideas aren't about summing up the masses in a compound—atomic mass is the mass of a single atom, the law of definite composition describes fixed elemental ratios, and the octet rule is about electron arrangements.

4. A 0.50 mol sample of an ideal gas at 1.00 atm and 25°C occupies what volume? Use $R = 0.0821 \text{ L}\cdot\text{atm}/\text{mol}\cdot\text{K}$.

A. 12.23 L

B. 24.47 L

C. 6.02 L

D. 48.0 L

The main idea is using the ideal gas law, $PV = nRT$, to relate how much gas, its temperature, and the pressure determine the volume. Solve for V : $V = nRT / P$. Convert 25°C to kelvin: $25 + 273.15 = 298 \text{ K}$. Then $V = (0.50 \text{ mol})(0.0821 \text{ L}\cdot\text{atm}/\text{mol}\cdot\text{K})(298 \text{ K}) / (1.00 \text{ atm}) \approx 12.23 \text{ L}$. So, at 25°C and 1 atm, half a mole of an ideal gas occupies about 12.23 liters. For context, 1.00 mole would be about 24.47 L, illustrating how volume scales with the amount of gas. The other numbers would require different amounts of gas or different conditions to match those volumes.

5. ____ are formed when air moves counterclockwise around a low pressure and clockwise around a high pressure.

A. Anticyclones

B. Cyclones

C. Tornadoes

D. Monsoons

The pattern describes how air circulates around pressure centers due to the pressure gradient force and the Coriolis effect. In the Northern Hemisphere, air moving toward a low-pressure center turns counterclockwise, while air flowing outward from a high-pressure center turns clockwise. So, air moving counterclockwise around a low pressure and clockwise around a high pressure corresponds to cyclones, which are low-pressure systems. Anticyclones rotate clockwise around high pressure (the opposite pattern). Tornadoes are localized violent vortices, and monsoons are seasonal wind systems, not defined by this circulation around a pressure center.

6. If 3 moles of O_2 react according to $2 \text{ H}_2 + \text{O}_2 \rightarrow 2 \text{ H}_2\text{O}$, how many moles of H_2 are required?

A. 3 moles

B. 1 mole

C. 6 moles

D. 9 moles

The key idea is using the mole ratio from the balanced equation. The equation shows that 2 moles of hydrogen react with 1 mole of oxygen. So for every 1 mole of O_2 , you need 2 moles of H_2 . If you have 3 moles of O_2 , multiply by 2 to get 6 moles of H_2 . Therefore, 6 moles of hydrogen are required.

7. The period of a wave with a frequency of 60 Hz is approximately what?

- A. 0.0167 s
- B. 0.6 s
- C. 16.7 s
- D. 0.00167 s

Period is the time for one complete cycle, and frequency tells how many cycles happen each second. They are reciprocals, so $T = 1/f$. For a frequency of 60 Hz, the period is $1/60$ second, which equals about 0.0167 s. That's why 0.0167 s is the correct period. If you check the other values, they correspond to different frequencies: 0.6 s would mean about 1.667 Hz, 16.7 s would be about 0.06 Hz, and 0.00167 s would be about 600 Hz.

8. A light ray enters water ($n \approx 1.33$) from air ($n \approx 1.00$) at 30° . Using Snell's law, what is the refracted angle approximately?

- A. About 22.1°
- B. About 12°
- C. About 30°
- D. About 45°

Snell's law relates the incident angle, the refractive indices, and the refracted angle: $n_1 \sin(\theta_1) = n_2 \sin(\theta_2)$. Here light goes from air ($n_1 \approx 1.00$) into water ($n_2 \approx 1.33$) with $\theta_1 = 30^\circ$. Solve for θ_2 : $\sin(\theta_2) = (n_1/n_2) \sin(\theta_1) = (1.00/1.33) \times \sin(30^\circ) \approx 0.376$. Therefore $\theta_2 \approx \arcsin(0.376) \approx 22^\circ$. Since the ray enters a denser medium, it bends toward the normal, giving a refracted angle smaller than the incident angle. That's why the angle is about 22 degrees.

9. Which cloud type is listed as the first item in the cloud types list?

- A. Cirrus
- B. Cumulus
- C. Stratus
- D. Nimbus

Recognizing how cloud types are organized in introductory meteorology, Cirrus are the high, wispy clouds that often appear first in standard classifications. Their name and appearance embody the beginning of many cloud-type lists, which typically start with the high-altitude genus Cirrus before moving to other forms like Cumulus (puffy, lower clouds) and Stratus (flat, layered clouds). Nimbus isn't a standalone cloud type in the same sense; it's a precipitation indication used with other genera (like cumulonimbus or nimbostratus), so it isn't the first item. So Cirrus is the best answer because it's commonly listed first as the representative high-altitude cloud type.

10. What is the third cloud type in the list?

- A. Cirrus
- B. Cumulus
- C. Stratus
- D. Nimbus

The list follows a progression from high wispy clouds to lower layered ones, so the third item is the flat, spread-out layer known as Stratus. Stratus clouds form in broad, uniform sheets that cover the sky, often giving overcast conditions and sometimes light drizzle. This differs from Cirrus, which are thin, wispy high clouds, and from Cumulus, which are puffy, cottony clouds with a distinct vertical build. Nimbus isn't a standalone cloud genus; it signals rain and is usually paired with another type (like Nimbostratus or Cumulonimbus). So the third in the sequence is Stratus.

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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://dualenrollmentphysicalscimidterm.examzify.com>

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

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