

JMSS SCIENCE 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. Which amino acid is explicitly mentioned as being coded by CCC and CCT?

- A. Glycine
- B. Alanine
- C. Leucine
- D. Valine

2. Comparative anatomy shows that

- A. They have no relationship.
- B. They evolved completely independently.
- C. They share a common ancestor in distant evolutionary past.
- D. They are the same species.

3. Approximately how many genes are contained in a nucleus?

- A. 5,000
- B. 20,000
- C. 50,000
- D. 100,000

4. Which term describes a mirror whose reflecting surface is shaped like a parabola?

- A. Spherical mirror
- B. Parabolic mirror
- C. Flat mirror
- D. Convex mirror

5. Which term is defined as a type of relationship where one organism benefits and the other is harmed?

- A. Parasitism
- B. Mutualism
- C. Commensalism
- D. Symbiosis

6. Hubble's observations showed that the universe is expanding because recessional velocities are proportional to what?
- A. Mass
 - B. Distances
 - C. Temperatures
 - D. Brightness
7. Who first proposed the idea of atoms and coined the term 'atomos'?
- A. Empedocles
 - B. John Dalton
 - C. J.J Thomson
 - D. Democritus
8. Which formula expresses the relationship for parallel resistances?
- A. $R_{eq} = R_1 + R_2 + R_3$
 - B. $R_{eq} = 1/(1/R_1 + 1/R_2 + 1/R_3)$
 - C. $R_{eq} = R_1 * R_2$
 - D. $1/R_{eq} = 1/R_1 + 1/R_2 + 1/R_3$
9. Which phenomenon describes a warm ocean current along the equator near Ecuador?
- A. La Niña
 - B. The Gulf Stream
 - C. The Pacific Decadal Oscillation
 - D. El Niño
10. Mutualism is best defined as a relationship in which
- A. Parasitism
 - B. Mutualism
 - C. Commensalism
 - D. Symbiosis

Answers

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

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Explanations

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1. Which amino acid is explicitly mentioned as being coded by CCC and CCT?

- A. Glycine**
- B. Alanine
- C. Leucine
- D. Valine

Three-nucleotide codons in mRNA specify amino acids. The codons CCC and CCT both code for the amino acid proline. None of the options list proline, whose codons are CCC and CCT. For reference, glycine is coded by GGU/GGC/GGA/GGG; alanine by GCU/GCC/GCA/GCG; leucine by UUA/UUG/CUU/CUC/CUA/CUG; valine by GUU/GUC/GUA/GUG.

2. Comparative anatomy shows that

- A. They have no relationship.
- B. They evolved completely independently.
- C. They share a common ancestor in distant evolutionary past.**
- D. They are the same species.

Comparative anatomy shows how related organisms share a common heritage that has been modified over time. When you compare the skeletons of different vertebrates, such as humans, cats, whales, and bats, you often find a similar arrangement of bones in their forelimbs. That pattern isn't just about what the limbs do today; it reflects a shared blueprint inherited from a single ancestor. Over millions of years, each lineage tweaked that blueprint to fit its environment, but the basic bone arrangement remains, signaling a distant common origin. That's why the best choice is that they share a common ancestor in distant evolutionary past. The other ideas don't fit because the observed structural similarity points to relatedness, not complete independence or no relationship; and comparing species isn't about being the same species.

3. Approximately how many genes are contained in a nucleus?

- A. 5,000
- B. 20,000**
- C. 50,000
- D. 100,000

Think of the nucleus as the library that holds our genome. In humans, there are about 20,000 distinct genes that code for proteins, plus additional genes for various RNAs. That makes roughly 20,000 genes contained in a nucleus when we talk about the number of different genes present. This is a standard, widely cited figure for the human genome. The other numbers are far from typical counts for human genes: 5,000 is too few, while 50,000 or 100,000 would be more than the human genome contains even when including noncoding RNA genes. If you consider that a diploid cell has two copies of each gene, you'd have two alleles for each gene, but the question usually refers to distinct genes rather than copies.

4. Which term describes a mirror whose reflecting surface is shaped like a parabola?

- A. Spherical mirror
- B. Parabolic mirror**
- C. Flat mirror
- D. Convex mirror

A parabolic mirror is defined by its reflecting surface being shaped like a parabola, and the key idea is how that shape handles incoming light. A parabola has the property that light rays coming in parallel to its axis reflect and converge at a single point, the focus. That means distant light is concentrated to one spot, which is why parabolic mirrors are ideal for gathering and focusing light in systems like telescopes, satellite dishes, and solar concentrators. Other shapes don't produce this same single focus: a spherical mirror can focus parallel rays poorly due to spherical aberration; a flat mirror simply reflects without changing the convergence or divergence of the beam; a convex mirror makes parallel rays diverge, creating a smaller, virtual image instead of a real focus.

5. Which term is defined as a type of relationship where one organism benefits and the other is harmed?

- A. Parasitism**
- B. Mutualism
- C. Commensalism
- D. Symbiosis

Parasitism is a relationship in which one organism benefits at the expense of another. The parasite gains nutrients, shelter, or a habitat, while the host suffers harm, such as reduced fitness or health problems. This fits the described concept because the benefit goes to one participant and the cost to the other. For contrast, mutualism involves both organisms benefiting; commensalism is when one benefits while the other is largely unaffected; and symbiosis is a broader term that covers several types of close associations, not a single one-sided harm. Examples include tapeworms in the intestines or ticks feeding on blood, illustrating the one-sided advantage that defines parasitism.

6. Hubble's observations showed that the universe is expanding because recessional velocities are proportional to what?

- A. Mass
- B. Distances**
- C. Temperatures
- D. Brightness

The key idea is Hubble's law: galaxies appear to be receding from us, and the speed at which they recede increases in direct proportion to how far away they are. When we look at the light from distant galaxies, its redshift tells us their recessional velocity, and plotting that velocity against distance shows a straight-line relationship: v is proportional to d . This linear pattern means space itself is expanding, carrying galaxies along with it as it stretches. The constants of nature that set this behavior aren't the galaxy's mass, its temperature, or how bright it appears. Those properties don't govern how fast a galaxy should be moving away just because it's farther out. Instead, what matters is distance: the farther a galaxy is, the faster it seems to recede, precisely because the universe is expanding.

7. Who first proposed the idea of atoms and coined the term 'atomos'?

- A. Empedocles
- B. John Dalton
- C. J.J Thomson
- D. Democritus**

Understanding begins with the idea that matter is made of tiny, indivisible pieces. Democritus first proposed this notion, arguing that everything is composed of small, indivisible particles he called atomos. The Greek term literally means indivisible, and his use of it established the word's origin in science. Although later scientists like Dalton, Thomson, and others expanded and refined atomic theory, they did not coin the term or initiate the original idea. That early conceptual spark—atoms as fundamental, indivisible building blocks—comes from Democritus.

8. Which formula expresses the relationship for parallel resistances?

- A. $R_{eq} = R_1 + R_2 + R_3$
- B. $R_{eq} = 1/(1/R_1 + 1/R_2 + 1/R_3)$
- C. $R_{eq} = R_1 * R_2$
- D. $1/R_{eq} = 1/R_1 + 1/R_2 + 1/R_3$**

When resistors are connected in parallel, the voltage across each one is the same, while the currents through them add up. Using Ohm's law, the total current is $I = V/R_1 + V/R_2 + V/R_3$. The equivalent resistance R_{eq} is the total voltage divided by the total current, so $R_{eq} = V / [V(1/R_1 + 1/R_2 + 1/R_3)] = 1 / (1/R_1 + 1/R_2 + 1/R_3)$. This shows the key relationship: the reciprocal of the total resistance equals the sum of the reciprocals of the individual resistances. It's often handy to rearrange that into $R_{eq} = 1 / (1/R_1 + 1/R_2 + 1/R_3)$, which is just another way to express the same idea. For a quick check, if $R_1 = 6 \Omega$, $R_2 = 3 \Omega$, and $R_3 = 2 \Omega$, then $1/R_{eq} = 1/6 + 1/3 + 1/2 = 1$, so $R_{eq} = 1 \Omega$, which is smaller than any individual resistor. The series case would add the resistances, not use reciprocals.

9. Which phenomenon describes a warm ocean current along the equator near Ecuador?

- A. La Niña
- B. The Gulf Stream
- C. The Pacific Decadal Oscillation
- D. El Niño**

El Niño describes the warming of surface waters in the tropical Pacific Ocean, especially along the equator near Ecuador and Peru. When the trade winds weaken, warm surface water that usually sits in the western Pacific moves eastward, creating a persistent warm pool in the central and eastern Pacific. This warming alters weather patterns around the world, bringing changes like wetter conditions in some regions and drought in others. The Gulf Stream is a warm Atlantic current, La Niña is the cooler counterpart in the Pacific, and the Pacific Decadal Oscillation is a long-term climate pattern that can be warm or cool over decades, not specifically this equatorial warming event.

10. Mutualism is best defined as a relationship in which

- A. Parasitism
- B. Mutualism**
- C. Commensalism
- D. Symbiosis

Mutualism is a two-way beneficial relationship. In this type of interaction, each participant gains something that helps it survive or reproduce, so both sides come away better off. Think of bees and flowers: bees get nectar for food, and flowers get help with pollination. Another example is gut bacteria that help break down food and synthesize nutrients the host can use. Because the defining feature is two-way benefit, this fits best.

Parasitism, by contrast, is when one partner gains at the expense of the other. A relationship where one organism benefits while the other is harmed doesn't fit mutualism. Commensalism describes a scenario where one partner benefits and the other is largely unaffected, which also isn't mutual benefit. Symbiosis is a broad term for any close living-together relationship, including mutualism, parasitism, and commensalism, so it's the umbrella idea rather than the specific two-way benefit described here.

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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://jmssscience.examzify.com>

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

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