JMSS Science Practice Test (Sample)

Study Guide

Everything you need from our exam experts!

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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. Fault is:

- **A. A volcanic crater**
- **B. A mineral seam**
- **C. A crack in the earth's crust due to rock cooling**
- **D. A crack in the earth's crust resulting from the displacement of one side with respect to the other**

2. During eutrophication, what happens to dissolved oxygen (O_2) levels as biochemical oxygen demand (BOD) increases?

- **A. O_2 declines**
- **B. O_2 rises**
- **C. O_2 remains unchanged**
- **D. O_2 fluctuates**

3. What are gonads?

- **A. Sex glands**
- **B. Digestive glands**
- **C. Endocrine glands in the brain**
- **D. Sweat glands**

4. Form of reproductive isolation where two populations are separated physically by geographic barriers such as rivers, mountains, or stretches of water.

- **A. Geographical Isolation**
- **B. Artificial Selection**
- **C. Karyotype**
- **D. Haploid**

5. Which profession focuses on the study of water and its cycle?

- **A. Meteorologist**
- **B. Geologist**
- **C. Oceanographer**
- **D. Hydrologist**

6. Which statement best describes asexual reproduction?

A. Involves two parents combining genetic material

B. Requires pollination

C. Produces genetic diversity rapidly

D. Reproduces by a single parent without genetic material from another

7. Which formula expresses the relationship for parallel resistances?

A. Req = R1 + R2 + R3

B. Req = 1/(1/R1 + 1/R2 + 1/R3)

C. Req = R1 * R2

D. 1/Req = 1/R1 + 1/R2 + 1/R3

8. What is a scientific theory?

A. A hypothesis that remains untested.

B. A simple model used to explain phenomena.

C. A well-tested concept that explains a wide range of observations.

D. A casual explanation for a single observation.

9. In clinical research, what is a placebo?

A. A fake drug with no active ingredients

B. A fake drug used in testing of medication

C. A measurement instrument

D. An actual medication

10. Seismic waves are vibrations that travel through which medium?

A. Water

B. Air

C. Earth

D. Vacuum

Answers

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

Explanations

1. Fault is:

A. A volcanic crater

B. A mineral seam

C. A crack in the earth's crust due to rock cooling

D. A crack in the earth's crust resulting from the displacement of one side with respect to the other

A fault is a crack in the Earth's crust along which rocks on opposite sides have moved past each other under tectonic forces. The key idea is the movement: one side shifts relative to the other. That's why this option is the best fit, since it explicitly describes displacement between the two sides. The other ideas don't fit because they describe different features: a volcanic crater is formed by eruption, not by rocks sliding past each other; a mineral seam is a layer of minerals within rock, not a break with movement; and a crack from cooling is a joint or fracture without the rocks shifting along the crack.

2. During eutrophication, what happens to dissolved oxygen (O2) levels as biochemical oxygen demand (BOD) increases?

A. O2 declines

B. O2 rises

C. O2 remains unchanged

D. O2 fluctuates

During eutrophication, nutrients fuel algal blooms and more organic material in the water. Biochemical oxygen demand (BOD) is a measure of how much oxygen microorganisms need to decompose that organic matter. As BOD rises, these microbes consume more dissolved oxygen through respiration, so the available oxygen in the water drops. This leads to lower dissolved oxygen levels, which can stress or kill aquatic life. Keep in mind that daytime photosynthesis by algae can temporarily raise oxygen, but the overall effect of higher BOD is a decline in O2.

3. What are gonads?

A. Sex glands

B. Digestive glands

C. Endocrine glands in the brain

D. Sweat glands

Gonads are the body's primary sex glands. They produce the gametes needed for reproduction—eggs in the ovaries and sperm in the testes—and they release sex hormones such as estrogen, progesterone, and testosterone that guide sexual development and reproductive function. They're not digestive glands, which handle digestion, nor sweat glands, which regulate perspiration, nor the brain's endocrine glands that control other hormones. In short, gonads are the organs dedicated to making sex cells and the hormones that influence sexual characteristics and reproduction.

4. Form of reproductive isolation where two populations are separated physically by geographic barriers such as rivers, mountains, or stretches of water.

A. Geographical Isolation

B. Artificial Selection

C. Karyotype

D. Haploid

Geographic isolation occurs when physical barriers like rivers, mountains, or bodies of water split a population so individuals can't mate with each other. This stops gene flow, and over generations the separated groups accumulate genetic differences due to mutation, drift, and distinct environmental pressures, eventually leading to reproductive isolation and, often, speciation. The other terms describe different ideas: artificial selection is human-guided breeding, karyotype refers to chromosome structure, and haploid denotes a single set of chromosomes, none of which capture the idea of a physical barrier dividing populations.

5. Which profession focuses on the study of water and its cycle?

A. Meteorologist

B. Geologist

C. Oceanographer

D. Hydrologist

Understanding which field studies water and its cycle. Hydrologists study water, its distribution, and how it moves through Earth's systems. They focus on the water cycle—evaporation from oceans and land, condensation forming clouds, precipitation, infiltration into soil, and runoff into rivers and lakes—tracking how these processes shape groundwater, surface water, and overall water resources. This work helps with managing freshwater supplies, predicting floods and droughts, and protecting water quality. The other fields focus on different aspects: meteorologists study the atmosphere and weather patterns, geologists examine rocks and Earth materials, and oceanographers study the oceans themselves.

6. Which statement best describes asexual reproduction?

A. Involves two parents combining genetic material

B. Requires pollination

C. Produces genetic diversity rapidly

D. Reproduces by a single parent without genetic material from another

Asexual reproduction is when offspring arise from a single parent without combining genetic material from another individual. In this mode, the new organisms are typically genetically identical or very similar to the parent because the cells divide by mitosis (think binary fission, budding, or vegetative propagation). No fertilization or gamete fusion is involved, and there's no need for pollination. This is why reproducing by a single parent without genetic material from another is the best description. While it can produce many offspring quickly, it usually yields clones, with genetic diversity mainly arising only through random mutations rather than mixing genomes from two parents.

7. Which formula expresses the relationship for parallel resistances?

A. Req = R1 + R2 + R3

B. Req = 1/(1/R1 + 1/R2 + 1/R3)

C. Req = R1 * R2

D. 1/Req = 1/R1 + 1/R2 + 1/R3

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/R1 + V/R2 + V/R3. The equivalent resistance Req is the total voltage divided by the total current, so Req = V / [V(1/R1 + 1/R2 + 1/R3)] = 1 / (1/R1 + 1/R2 + 1/R3). 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 Req = 1 / (1/R1 + 1/R2 + 1/R3), which is just another way to express the same idea. For a quick check, if R1 = 6 Ω, R2 = 3 Ω, and R3 = 2 Ω, then 1/Req = 1/6 + 1/3 + 1/2 = 1, so Req = 1 Ω, which is smaller than any individual resistor. The series case would add the resistances, not use reciprocals.

8. What is a scientific theory?

A. A hypothesis that remains untested.

B. A simple model used to explain phenomena.

C. A well-tested concept that explains a wide range of observations.

D. A casual explanation for a single observation.

Think of a scientific theory as a well-supported framework that explains a wide range of observations and experiments. It's more than just a guess or a single fact: it brings many different findings under a coherent set of ideas and can make predictions about new situations. Because it's built from extensive evidence and repeated testing, a theory is trusted, though it can be revised if new data emerge. This is why the description "a well-tested concept that explains a wide range of observations" is the best fit. In contrast, an untested hypothesis is just a tentative statement awaiting evidence, a simple model describes only a specific aspect or a limited situation, and a casual explanation for a single observation lacks the depth and testing that characterize a theory.

9. In clinical research, what is a placebo?

A. A fake drug with no active ingredients

B. A fake drug used in testing of medication

C. A measurement instrument

D. An actual medication

A placebo is an inert substance used as a control in clinical trials to separate the drug's true effects from those caused by expectations or other biases. It looks like the real medication but has no active ingredients, which lets researchers compare outcomes against a neutral baseline. This use in testing of medication is what makes it the best description: it captures both its inert nature and its role in evaluating a drug's effectiveness. It's not a measurement instrument, and it's not an actual medication.

10. Seismic waves are vibrations that travel through which medium?

A. Water

B. Air

C. Earth

D. Vacuum

Seismic vibrations need something to move through, so they propagate through matter. These waves travel through Earth materials—rock, magma, and other parts of the planet's interior—rather than through empty space. A vacuum has no particles to carry the motion, so waves can't travel there. That's why the medium for seismic waves is the Earth itself. While water and air can carry other kinds of waves (like sound), seismic waves are tied to moving through the Earth, and their behavior helps scientists learn about the planet's interior.

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!