

AICE Marine Science Paper 2 Practice Exam (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

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- 1. What environmental factor affects rocky shores by causing organisms to dry out?**
 - A. Temperature**
 - B. Desiccation**
 - C. Wave Action**
 - D. Light Intensity**

- 2. How often are middle-tide zones exposed to air?**
 - A. Once per day**
 - B. Twice per day**
 - C. All day long**
 - D. Not at all**

- 3. A line transect is used to count species by which method?**
 - A. Marking and releasing organisms**
 - B. Placing a line and counting touching species**
 - C. Sampling randomly from different points**
 - D. Using a net to capture organisms**

- 4. How much energy is transferred from algae to clupeid fish, based on the provided energy values?**
 - A. 6.2%**
 - B. 8.5%**
 - C. 11.7%**
 - D. 15.2%**

- 5. What is the process of bioaccumulation?**
 - A. The dispersion of nutrients in water**
 - B. The accumulation of substances in an organism over time**
 - C. The decomposition of dead marine organisms**
 - D. The transfer of energy through food webs**

- 6. Which of the following organisms is commonly found in the high-tide zone?**
- A. Sea urchins**
 - B. Mussels**
 - C. Crabs**
 - D. Sea stars**
- 7. Which of the following is a biotic factor in an ecosystem?**
- A. Temperature**
 - B. Salinity**
 - C. Symbiosis**
 - D. pH level**
- 8. What substance is primarily responsible for the acidification of the oceans?**
- A. Oxygen**
 - B. Carbon dioxide**
 - C. Methane**
 - D. Nitrogen**
- 9. From where to where is the energy transfer calculated in the provided food chain?**
- A. Sun to Algae only**
 - B. Algae to Mako Sharks**
 - C. Sun to Mako Sharks**
 - D. Sun to Tunas**
- 10. What process allows bacteria near hydrothermal vents to produce glucose?**
- A. Chemosynthesis**
 - B. Photosynthesis**
 - C. Fermentation**
 - D. Respiration**

Answers

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

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Explanations

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1. What environmental factor affects rocky shores by causing organisms to dry out?

- A. Temperature**
- B. Desiccation**
- C. Wave Action**
- D. Light Intensity**

Desiccation refers specifically to the process of drying out or losing moisture. In the context of rocky shores, this environmental factor is particularly significant due to the tidal fluctuations that expose many marine organisms to air for extended periods. During low tides, organisms such as barnacles, sea stars, and mollusks are often left without water, which can lead to dehydration and increased stress on their physiological systems. While temperature, wave action, and light intensity can influence life on rocky shores, they do not directly refer to the issue of drying out. Temperature may affect metabolic rates and reproductive cycles, wave action can impact erosion and provide nutrients, and light intensity plays a role in photosynthesis for autotrophic organisms. However, it is desiccation that most directly describes the challenge faced by organisms on rocky shores during low tidal periods, making it the appropriate and most precise answer.

2. How often are middle-tide zones exposed to air?

- A. Once per day**
- B. Twice per day**
- C. All day long**
- D. Not at all**

The middle-tide zone is exposed to air twice per day due to the regular cycle of tidal movements caused by the gravitational pull of the moon and the sun. Tides rise and fall, leading to specific areas of the intertidal zone being submerged in water during high tide and then exposed to air at low tide. During high tide, the middle-tide zone will be underwater, providing a habitat for various marine organisms. However, as the tide recedes to low tide, this zone becomes exposed to the air, allowing these organisms to experience both aquatic and terrestrial conditions. This cyclical exposure is what characterizes the middle-tide zone, and it repeats with each tidal cycle, illustrating the dynamic nature of coastal ecosystems.

3. A line transect is used to count species by which method?

- A. Marking and releasing organisms
- B. Placing a line and counting touching species**
- C. Sampling randomly from different points
- D. Using a net to capture organisms

A line transect is an effective method for counting and assessing species in a specific habitat. This method involves laying down a straight line across a habitat and then systematically observing and recording the species that come into contact with the line. By counting only those species that touch the line, researchers can obtain a clear and straightforward representation of species distribution and abundance along that transect. This technique is particularly useful in ecological studies as it helps to minimize bias and allows for consistent data collection across different areas. By focusing on the organisms that are directly associated with the line, scientists can gather reliable data on species presence and density in specific habitats. In contrast, the other methods mentioned are not utilized in a line transect approach. Marking and releasing organisms is a different technique used primarily to study population dynamics and estimate population sizes. Sampling randomly would provide varied data that might not allow for the focused assessment that a line transect offers. Using a net to capture organisms is more invasive and does not align with the standardized methodology of a line transect, which emphasizes observing and recording rather than actively capturing organisms.

4. How much energy is transferred from algae to clupeid fish, based on the provided energy values?

- A. 6.2%
- B. 8.5%
- C. 11.7%**
- D. 15.2%

In ecological studies, energy transfer between trophic levels is often expressed as a percentage of energy consumed by the next level. To determine how much energy is transferred from algae to clupeid fish accurately, one must consider the efficiency of energy transfer in marine food webs. Typically, energy transfer between trophic levels is not 100% efficient due to losses at each stage, primarily through metabolic processes, respiration, and excretion. The value of 11.7% as the transfer rate is a realistic figure that can be supported by typical primary producer to primary consumer energy transfer rates observed in marine ecosystems. This suggests that when clupeid fish consume algae, they can assimilate about 11.7% of the energy that was originally contained in the algae. Reasonable assessments in marine food webs indicate that this percentage aligns well with established research findings. Factors such as the type of algae, the method of consumption by fish, and ecological conditions can influence the efficiency but typically do not push the transfer rate too far above this value. Understanding energy transfer dynamics is crucial for comprehending the structure and function of marine ecosystems, as they illustrate the biological efficiency and ecological balance within these environments.

5. What is the process of bioaccumulation?

- A. The dispersion of nutrients in water
- B. The accumulation of substances in an organism over time**
- C. The decomposition of dead marine organisms
- D. The transfer of energy through food webs

Bioaccumulation refers to the gradual accumulation of substances, such as pesticides, heavy metals, or other environmental pollutants, in an organism's body over time. This process occurs when an organism absorbs these harmful substances at a rate faster than it can eliminate them. As a result, concentrations of these toxins can increase within the organism, particularly in tissues like fat. This is particularly concerning for species higher up the food chain (predators), as they consume organisms that may already be contaminated, leading to even higher levels of these substances in their bodies. In contrast, the other options describe different biological and ecological processes. The dispersion of nutrients pertains to how nutrients are spread through aquatic environments and is not specifically related to an organism's internal accumulation of harmful substances. The decomposition of dead marine organisms involves the breakdown and recycling of organic material, which is an entirely different process focused on nutrient cycling rather than accumulation within living organisms. The transfer of energy through food webs is about how energy moves from one trophic level to another, emphasizing energy flow rather than the accumulation of harmful substances in individual organisms.

6. Which of the following organisms is commonly found in the high-tide zone?

- A. Sea urchins
- B. Mussels
- C. Crabs**
- D. Sea stars

Crabs are commonly found in the high-tide zone due to their ability to tolerate various environmental conditions, including exposure to air when the tide recedes. This habitat is characterized by its fluctuating conditions, with crabs often utilizing the rocks and crevices to shelter from predators and drying out during low tide. They are well-adapted to these conditions, with behaviors that allow them to manage their moisture and find food even in the harsher parts of the intertidal zone. In contrast, other organisms often prefer different zones. Sea urchins, for example, are typically found in subtidal areas where they can remain submerged for longer periods to feed on algae. Mussels also usually inhabit the mid-tide zone, where they can remain in water for more of the time, relying on the water for filter feeding. Sea stars tend to occupy the lower intertidal zone, where they can access their prey, like mollusks, more easily. Each of these organisms has specific adaptations that suit them to their preferred environments, illustrating the diversity of life in intertidal habitats.

7. Which of the following is a biotic factor in an ecosystem?

A. Temperature

B. Salinity

C. Symbiosis

D. pH level

In an ecosystem, biotic factors are the living components that can interact with one another and affect one another's existence. Symbiosis is a clear example of a biotic factor as it involves the interaction between different species living in close physical proximity, often to the benefit of at least one of the parties involved. This can include relationships such as mutualism, commensalism, and parasitism, all of which significantly influence population dynamics, species interactions, and community structure within an ecosystem. The other options mentioned—temperature, salinity, and pH level—are considered abiotic factors. These are the non-living chemical and physical components of the environment that affect living organisms and the ecosystems they inhabit. While they play crucial roles in determining the types of organisms that can survive and thrive in a given environment, they do not involve any form of biological interaction between living entities. Hence, these factors are not classified as biotic.

8. What substance is primarily responsible for the acidification of the oceans?

A. Oxygen

B. Carbon dioxide

C. Methane

D. Nitrogen

The primary substance responsible for the acidification of the oceans is carbon dioxide. When carbon dioxide is released into the atmosphere, a significant portion of it is absorbed by the oceans. This absorption leads to a series of chemical reactions that result in the formation of carbonic acid. The presence of carbonic acid lowers the pH of seawater, making it more acidic. This process is a significant environmental concern because increased acidity can harm marine life, particularly organisms that rely on calcium carbonate, such as corals and shellfish, as it affects their ability to form shells and skeletons. Understanding the role of carbon dioxide in ocean acidification highlights the broader impact of greenhouse gas emissions on marine ecosystems, emphasizing the need for measures to reduce carbon emissions to protect ocean health.

9. From where to where is the energy transfer calculated in the provided food chain?

- A. Sun to Algae only**
- B. Algae to Mako Sharks**
- C. Sun to Mako Sharks**
- D. Sun to Tunas**

In a food chain, energy transfer is typically observed from one trophic level to another, starting with primary producers and moving up to various consumers. In this scenario, the energy transfer being calculated refers specifically to the movement of energy through the food web, beginning with the initial energy source, which is usually the sun, and then moving through the different organisms. Choosing the option that specifies energy transfer from algae to Mako sharks accurately captures the understanding of energy flow between distinct trophic levels. Algae, as primary producers, convert solar energy into chemical energy via photosynthesis. They serve as the base of the food chain, providing energy to herbivores such as smaller fish or invertebrates. Mako sharks, as apex predators, occupy a higher trophic level and rely on the energy stored in the bodies of their prey, which would include tunas or various fish that feed on algae and other sources. The focus on algae to Mako sharks highlights an important aspect of energy transfer: energy diminishes as it moves up through the food chain due to loss at each trophic level, primarily through metabolic processes and heat. Therefore, examining this specific energy transfer aligns with the scientific understanding of trophic dynamics. The other options either incorrectly limit the scope

10. What process allows bacteria near hydrothermal vents to produce glucose?

- A. Chemosynthesis**
- B. Photosynthesis**
- C. Fermentation**
- D. Respiration**

The correct answer is based on the process known as chemosynthesis. This process occurs primarily in environments where sunlight is not available, such as the deep ocean near hydrothermal vents. Organisms that rely on chemosynthesis, such as certain bacteria, can convert inorganic substances, like hydrogen sulfide released from the vents, into organic compounds, including glucose. In chemosynthesis, these bacteria utilize the energy released from the oxidation of inorganic molecules to produce glucose from carbon dioxide and water. This energy-driven conversion is essential for sustaining life in these extreme environments, as it provides a primary source of energy and organic material for other organisms in the deep-sea food web. While photosynthesis involves the conversion of light energy into chemical energy using carbon dioxide and water to produce glucose, it's not applicable to hydrothermal vents where sunlight does not penetrate. Fermentation is another type of energy-producing process that does not involve inorganic sources and occurs anaerobically, while respiration requires oxygen and is also not the primary process used by bacteria near hydrothermal vents for glucose production. Thus, chemosynthesis stands out as the correct answer in this context.

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://aicemarinesciencepaper2.examzify.com>

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

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