CATEGORY B – MOSQUITO BIOLOGY AND CONTROL PRACTICE TEST (SAMPLE)

STUDY GUIDE

SAMPLE STUDY GUIDE WITH LIMITED QUESTIONS

VISIT US ONLINE FOR THE FULL VERSION STUDY GUIDE

https://catbmosquitobioandcontrol.examzify.com

Table of Contents

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. Name two metrics used to assess impact of vector control programs on malaria transmission.

A. Entomological inoculation rate (EIR) and vector density reduction.

B. Human landing rate and rainfall.

C. Blood meal analysis and parity rate.

D. Mosquito reproduction rate and wing length.

2. Which combination serves as the secondary vector and secondary reservoir for St. Louis Encephalitis (SLE)?

A. Cx. pipiens and wild birds

B. Ae. aegypti and horses

C. Cx. tarsalis and humans

D. An. gambiae and domestic cats

3. What is the role of non-chemical controls in Integrated Vector Management (IVM)?

A. They replace all chemical control measures.

B. They are too costly to implement.

C. They reduce reliance on chemicals and can slow resistance when used with other tools.

D. They have no impact on disease transmission.

4. Which two species are listed as causing dengue fever?

A. Ae. aegypti, Ae. albopictus

B. Ae. hexadontus, Ae. tahoensis

C. Ae. taeniorynchus, Ae. vexans

D. Ae. dorsalis, Ae. squamiger

5. Where is dog heartworm endemic?

A. Central Valley and Sierra Nevada mountains and foothills

B. Coastal plains of California

C. Great Plains

D. Southeastern coastal states

6. Explain how insecticide resistance can arise in mosquito populations and one major mechanism.

A. Random mutation only, not influenced by insecticides.

B. Insecticides never lead to resistance; populations remain susceptible.

C. Through selection pressure from insecticides; major mechanism includes target-site resistance (e.g., kdr) reducing sensitivity to pyrethroids.

D. Resistance arises only through behavioral avoidance, not physiological.

7. Dog heartworm endemic areas include which geographic region?

A. Central Valley and Sierra Nevada mountains and foothills

B. Coastal deserts

C. Arctic tundra

D. Tropical rainforest

8. Which pair of species is described as breeding in containers?

A. Ae. aegypti, Ae. albopictus

B. Ae. dorsalis, Ae. squamiger

C. Ae. tahoensis, Ae. washinoi

D. Ae. hexadontus, Ae. tahoensis

9. What do the terms exophagic and exophilic describe in mosquito behavior?

A. They describe outdoor biting and outdoor resting behavior.

B. They describe indoor resting behavior.

C. They describe preferred host species.

D. They describe egg-laying patterns.

10. What is a New Jersey light trap?

A. The most common and oldest trap, requiring a 110V power source and little attention after; nightly count of captured mosquitoes broken down by species

B. A trap that uses dry ice bait

C. A trap used for resting box density

D. A handheld trap for larval sampling

Answers

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

Explanations

1. Name two metrics used to assess impact of vector control programs on malaria transmission.

A. Entomological inoculation rate (EIR) and vector density reduction.

B. Human landing rate and rainfall.

C. Blood meal analysis and parity rate.

D. Mosquito reproduction rate and wing length.

The key idea is identifying measures that link mosquito populations to the risk of people getting infected. The two most informative metrics are the Entomological Inoculation Rate (EIR) and a reduction in vector density. EIR combines how often people are bitten by mosquitoes with how many of those mosquitoes carry the malaria parasite. It directly reflects the amount of transmission occurring in a community because it estimates the rate at which infectious bites reach people. If a vector control program lowers either the rate of bites or the fraction of infectious mosquitoes, the EIR drops, signaling reduced transmission risk. Reducing vector density is the other essential metric because fewer mosquitoes mean fewer opportunities for transmission. By measuring how many mosquitoes are present after interventions (adult traps, larval indices, etc.), you can gauge how much the population was suppressed and how that suppression is likely to affect transmission potential. Other metrics describe biting exposure, feeding behavior, age structure, or basic biology, but they don't tie directly to how much transmission is occurring. For example, human landing rate tells you exposure risk but not whether mosquitoes are infectious; rainfall, blood meal analysis, parity, wing length, and reproduction rate provide valuable biology context but don't directly quantify transmission impact.

2. Which combination serves as the secondary vector and secondary reservoir for St. Louis Encephalitis (SLE)?

A. Cx. pipiens and wild birds

B. Ae. aegypti and horses

C. Cx. tarsalis and humans

D. An. gambiae and domestic cats

St. Louis encephalitis virus is kept in nature by an exchange between birds and mosquitoes. Birds are the reservoir hosts that maintain the virus, while mosquitoes transmit it between birds and can occasionally infect people. Among mosquitoes, some species mainly feed on birds and serve as secondary vectors, helping move the virus around within the bird–mosquito cycle. Culex pipiens fits this role well because it readily feeds on birds and can bridge transmission to humans when needed. So pairing a Culex species that targets birds with wild birds as the reservoir reflects the secondary vector–reservoir dynamic of SLE. The other options involve mosquitoes not typically implicated in SLE transmission or vertebrates that do not sustain the virus in nature (horses, humans, cats).

3. What is the role of non-chemical controls in Integrated Vector Management (IVM)?

A. They replace all chemical control measures.

B. They are too costly to implement.

C. They reduce reliance on chemicals and can slow resistance when used with other tools.

D. They have no impact on disease transmission.

In Integrated Vector Management, the goal is to use a mix of complementary strategies rather than depend on a single method to control mosquitoes. Non-chemical controls fit this approach by targeting mosquitoes in different ways and at different life stages, often with fewer downsides than relying only on pesticides. They are the best choice here because they reduce how much chemical insecticide is needed and, when used together with other tools, slow the development of resistance. By removing or altering mosquito breeding sites, introducing natural predators, improving housing and environmental conditions, and using physical barriers, the overall pressure on mosquitoes is reduced. This diversification makes it harder for mosquitoes to adapt to any one method and helps sustain control efforts over time. Examples include eliminating standing water and other breeding habitats, habitat management, using larvivorous fish or microbial larvicides like Bti, and installing physical barriers such as screens or proper water storage that limit mosquito opportunities to breed or bite. These approaches can be cost-effective in the long run and often involve communities, which strengthens and sustains control. Non-chemical controls do not replace chemical measures entirely, and they do have an impact on disease transmission by lowering vector populations and biting rates, contributing to fewer cases.

4. Which two species are listed as causing dengue fever?

A. Ae. aegypti, Ae. albopictus

B. Ae. hexadontus, Ae. tahoensis

C. Ae. taeniorynchus, Ae. vexans

D. Ae. dorsalis, Ae. squamiger

Dengue is spread mainly by mosquitoes in the Aedes genus, with two species standing out as the primary transmitters: Aedes aegypti and Aedes albopictus. These mosquitoes are particularly effective vectors because they readily bite humans, breed in small water containers near homes, and feed during the day, creating frequent opportunities to pass the virus from an infected person to others. Aedes aegypti is especially close to human environments and highly anthropophilic, while Aedes albopictus, the Asian tiger mosquito, expands the reach of transmission in many areas and can also bite humans and acquire or transmit the virus. The other species listed are not recognized as primary dengue vectors, either because they don't bite humans as often, live in different habitats, or are associated with transmitting other diseases.

5. Where is dog heartworm endemic?

A. Central Valley and Sierra Nevada mountains and foothills

B. Coastal plains of California

C. Great Plains

D. Southeastern coastal states

Heartworm transmission depends on the presence of mosquitoes that can carry and deliver the parasite to dogs. The parasite needs to develop inside the mosquito and then be transmitted during a bite, and this development is temperature- and environment-dependent. The Central Valley and Sierra Nevada foothills provide conditions with irrigation, standing water, and warm-season windows that support stable mosquito populations year after year. That combination allows the heartworm life cycle to persist in dogs in that area, making it a region where the disease is considered endemic. In contrast, areas with cooler winters, less reliable mosquito habitats, or shorter warm seasons don't sustain continuous transmission as readily, so they are less typically described as endemic.

6. Explain how insecticide resistance can arise in mosquito populations and one major mechanism.

A. Random mutation only, not influenced by insecticides.

B. Insecticides never lead to resistance; populations remain susceptible.

C. Through selection pressure from insecticides; major mechanism includes target-site resistance (e.g., kdr) reducing sensitivity to pyrethroids.

D. Resistance arises only through behavioral avoidance, not physiological.

When mosquitoes are repeatedly exposed to an insecticide, survival becomes non-random. Individuals with genetic traits that reduce the insecticide's impact are more likely to live, reproduce, and pass those traits to their offspring. Over generations, the population shifts toward resistance because the resistant genes become more common. A major mechanism is target-site resistance, such as knockdown resistance (kdr). This involves changes in the insect's nerve-cell target—the voltage-gated sodium channel that pyrethroids bind to. Mutations in this channel lessen the insecticide's ability to affect nerve function, so mosquitoes with the altered channel survive exposure and produce resistant offspring. This exemplifies how a specific genetic change can directly diminish an insecticide's effectiveness. Other resistance routes exist, like metabolic detoxification or behavioral avoidance, but target-site resistance is a well-documented and prominent example of how resistance can arise through selection pressure from insecticides.

7. Dog heartworm endemic areas include which geographic region?

A. Central Valley and Sierra Nevada mountains and foothills

B. Coastal deserts

C. Arctic tundra

D. Tropical rainforest

Heartworm is spread by mosquitoes, so areas where mosquitoes are active for a long season and temperatures allow the parasite to develop inside the mosquito are considered endemic. The Central Valley and the Sierra Nevada foothills provide warm summers and plenty of standing water from irrigation, creating abundant mosquito habitats and enabling ongoing transmission to dogs. The other regions either lack reliable mosquito populations (coastal deserts), stay too cold for most of the year (Arctic tundra), or are not the typical endemic focus in educational context (tropical rainforest). Thus, this region best fits where dog heartworm is endemic.

8. Which pair of species is described as breeding in containers?

A. Ae. aegypti, Ae. albopictus

B. Ae. dorsalis, Ae. squamiger

C. Ae. tahoensis, Ae. washinoi

D. Ae. hexadontus, Ae. tahoensis

Container breeding is a hallmark of certain urban Aedes mosquitoes, which lay eggs in small water-filled containers around human dwellings. Aedes aegypti and Aedes albopictus are the classic examples: they exploit artificial containers such as tires, discarded buckets, flower pots, and other small water-holding receptacles, and their eggs can survive dry periods until rain fills the containers and hatches them. This adaptation helps them thrive in cities and makes them key disease vectors. The other pairs aren't as closely associated with container breeding; they are more often linked to natural or larger water habitats, so they don't fit the description as clearly.

9. What do the terms exophagic and exophilic describe in mosquito behavior?

A. They describe outdoor biting and outdoor resting behavior.

B. They describe indoor resting behavior.

C. They describe preferred host species.

D. They describe egg-laying patterns.

Exophagic and exophilic describe where a mosquito feeds and where it rests. Exophagic means the mosquitoes bite outdoors, not indoors. Exophilic means they rest outdoors after feeding. Taken together, they describe a pattern of outdoor biting and outdoor resting. That matches the option describing outdoor biting and outdoor resting behavior. The other choices refer to indoor resting (endophilic), host preference, or egg-laying patterns, which are about different aspects of mosquito behavior.

10. What is a New Jersey light trap?

A. The most common and oldest trap, requiring a 110V power source and little attention after; nightly count of captured mosquitoes broken down by species

B. A trap that uses dry ice bait

C. A trap used for resting box density

D. A handheld trap for larval sampling

The New Jersey light trap is an adult mosquito surveillance device that uses a bright light to attract host-seeking mosquitoes at night. A fan then pulls the attracted mosquitoes into a collection container so they can be counted and identified by species. It's widely used because it's one of the oldest and most common traps for monitoring adult mosquitoes, typically powered by standard 110V electricity, which makes setup straightforward and allows nightly operation with relatively little attention. This trap targets flying adults and provides species-specific counts, which is essential for tracking potential vectors like Culex. It does not rely on dry ice or CO2 bait, it isn't used for sampling resting mosquitoes, and it isn't a larval sampling device.

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://catbmosquitobioandcontrol.examzify.com

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