

MOALEM'S SURVIVAL OF THE SICKEST 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. What is the role of the G6PD enzyme in red blood cells, and why deficiency provides malaria resistance?**
 - A. G6PD catalyzes oxygen transport in RBCs.
 - B. G6PD stores iron for RBCs.
 - C. G6PD regulates RBC membrane stability.
 - D. G6PD helps generate NADPH to protect RBCs from oxidative damage; deficiency increases oxidative stress in infected cells, hindering parasite growth.

- 2. What approaches help estimate the timing of selection on lactase persistence mutations?**
 - A. Radiocarbon dating of residues
 - B. Haplotype analysis and ancient DNA studies to estimate timing of selection
 - C. Measuring current milk consumption
 - D. Satellite imaging of farms

- 3. What is described about skull shape in relation to climate?**
 - A. Skull shape may have evolved to facilitate heat storage and release depending on climate
 - B. Skull shape is random
 - C. Skull shape only affects aesthetics
 - D. Skull shape has no evolutionary significance

- 4. What behavioral manipulation does the hairworm induce in the grasshopper?**
 - A. It causes the grasshopper to drown itself
 - B. It makes the grasshopper jump into water to escape
 - C. It makes the grasshopper shed its skin
 - D. It makes the grasshopper feed on the worm

- 5. How do researchers determine the age of lactase persistence mutations?**
 - A. Through radiocarbon dating of milk residues in pottery.
 - B. Through measuring current allele frequencies only.
 - C. Through haplotype analysis and ancient DNA studies to estimate timing of selection.
 - D. Through observing current lactase enzyme activity in individuals.

- 6. Which of the following is NOT listed as a symptom of diabetes?**
- A. High blood sugar
 - B. Stroke
 - C. Dehydration
 - D. Hair loss
- 7. What is lactose intolerance and how does it relate to lactase persistence in humans?**
- A. Lactase non-persistence means continued lactase production into adulthood.
 - B. Lactase persistence leads to lactose intolerance in adulthood.
 - C. Lactase non-persistence leads to lactose intolerance after weaning; lactase persistence allows continued digestion of lactose into adulthood.
 - D. Lactase persistence has no impact on lactose digestion.
- 8. What is the evolutionary advantage of the rabies virus's manipulation that causes aggression and frothing at the mouth?**
- A. It promotes biting and spread of the virus via saliva.
 - B. It increases the host's ability to resist other infections.
 - C. It directly increases the host's lifespan to prolong infection.
 - D. It reduces the host's aggression, allowing stealthy spread.
- 9. Which statement best describes heterozygotes for thalassemia in malaria-endemic regions?**
- A. They have enhanced malaria resistance without severe disease.
 - B. They have no advantage and only burden.
 - C. They have more severe anemia than homozygotes.
 - D. They have higher malaria susceptibility.
- 10. What modern health risks are associated with unmanaged hemochromatosis?**
- A. Liver damage, diabetes, heart problems, hormonal issues, and joint problems when iron overload is not managed.
 - B. Only liver damage.
 - C. Only diabetes.
 - D. No health risks.

Answers

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

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Explanations

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1. What is the role of the G6PD enzyme in red blood cells, and why deficiency provides malaria resistance?

- A. G6PD catalyzes oxygen transport in RBCs.
- B. G6PD stores iron for RBCs.
- C. G6PD regulates RBC membrane stability.
- D. G6PD helps generate NADPH to protect RBCs from oxidative damage; deficiency increases oxidative stress in infected cells, hindering parasite growth.**

G6PD's main job in red blood cells is to drive the pentose phosphate pathway, producing NADPH. That NADPH powers the cell's antioxidant system, keeping glutathione in its reduced form and allowing red blood cells to detoxify reactive oxygen species. In malaria, the parasite lives inside these red blood cells, so the local oxidative environment matters for parasite survival. When G6PD is deficient, less NADPH means weaker antioxidant defenses and higher oxidative stress, which can hinder parasite growth or damage the infected cells, providing a protective effect against malaria. The other options don't fit because G6PD is not responsible for oxygen transport, iron storage, or direct membrane stability.

2. What approaches help estimate the timing of selection on lactase persistence mutations?

- A. Radiocarbon dating of residues
- B. Haplotype analysis and ancient DNA studies to estimate timing of selection**
- C. Measuring current milk consumption
- D. Satellite imaging of farms

Estimating when selection acted on lactase persistence mutations relies on genetic signals that build up around the advantageous allele over time, plus direct evidence from ancient genomes. When a lactase-persistence allele provides a fitness benefit, it increases in frequency quickly, and the surrounding DNA tends to stay tightly linked in long haplotypes because recombination hasn't had time to break those blocks apart. Analyzing the structure and length of these haplotypes, along with estimates of the allele's age, lets us infer how recently the selective sweep occurred and roughly when it started. Ancient DNA adds a crucial time dimension by providing genomes from different historical periods. By measuring how common the lactase-persistence allele is in samples from various eras, researchers can pinpoint when the allele first rose in frequency and track its spread through populations. This combination of haplotype information and direct temporal data from ancient genomes gives the most precise picture of the timing of selection. Other options don't target genetic timing. Radiocarbon dating residues can date materials but not when a genetic adaptation arose; measuring current milk consumption reflects present behavior rather than historical selective events; and satellite imaging of farms tracks agricultural activity, not genetic changes.

3. What is described about skull shape in relation to climate?

- A. Skull shape may have evolved to facilitate heat storage and release depending on climate
- B. Skull shape is random
- C. Skull shape only affects aesthetics
- D. Skull shape has no evolutionary significance

The main idea is that skull shape can adapt to climate to help regulate body heat. The head is a site where heat can be gained or lost, and the skull's size, shape, and features influence how efficiently heat is exchanged with the environment. In hot climates, natural selection can favor skull shapes that promote heat dissipation, increasing surface area or pathways for cooling. In cold climates, a more compact skull with less surface area helps conserve heat. This pattern fits with how cranial features vary across populations as an adaptive response to temperature and humidity demands, including aspects like how the nasal passages humidify and warm inspired air. So describing skull shape as evolving to facilitate heat retention or release depending on climate captures the thermoregulatory role of morphology. The other options treat skull shape as random, purely cosmetic, or without evolutionary significance, which doesn't reflect the observed link between climate and cranial form.

4. What behavioral manipulation does the hairworm induce in the grasshopper?

- A. It causes the grasshopper to drown itself
- B. It makes the grasshopper jump into water to escape
- C. It makes the grasshopper shed its skin
- D. It makes the grasshopper feed on the worm

The key idea is that the hairworm hijacks the grasshopper's behavior to reach a water environment, which the parasite needs to complete its life cycle. When the worm is ready to emerge, it alters the host's neural signals so the grasshopper is driven to seek out water and often leap into it. Entering the water is the crucial manipulated behavior, and drowning is a common outcome of that action, allowing the worm to exit and continue developing. So the real manipulation is steering the host toward water; the drowning result occurs because of that driven behavior. It's not about the grasshopper shedding skin or feeding on the worm.

5. How do researchers determine the age of lactase persistence mutations?

- A. Through radiocarbon dating of milk residues in pottery.
- B. Through measuring current allele frequencies only.
- C. Through haplotype analysis and ancient DNA studies to estimate timing of selection.**
- D. Through observing current lactase enzyme activity in individuals.

Dating a lactase persistence mutation relies on population-genetics clues rather than just present-day frequencies. The key idea is that when a beneficial allele rises rapidly in a population due to selection, it carries a long stretch of surrounding DNA with it, producing an extended haplotype and strong linkage around the mutation. Analyzing that haplotype structure and how quickly recombination has eroded it lets researchers estimate how long ago the mutation arose and when the selective sweep began. Ancient DNA adds crucial timing by providing actual samples from different eras that either carry or lack the mutation. Seeing the allele in older samples helps pin down the minimum age and shows how its frequency changed over time. Together, haplotype analysis and ancient DNA give a temporal framework for the mutation and the selection pressure acting on it, far more informative than looking at current allele frequencies alone or at enzyme activity today. Radiocarbon dating of milk residues wouldn't date the genetic variant itself, and measuring present enzyme activity doesn't reveal when the mutation appeared, so those approaches don't address the timing question.

6. Which of the following is NOT listed as a symptom of diabetes?

- A. High blood sugar
- B. Stroke
- C. Dehydration
- D. Hair loss**

Diabetes signs are mainly the effects of high blood glucose. When glucose stays high, the kidneys work to remove it, and that pulls extra water with it, leading to dehydration and increased thirst. So high blood sugar and dehydration are classic, directly tied symptoms. Stroke isn't a symptom you'd list for diabetes; it's a serious vascular complication that people with diabetes have a higher risk of over time. Hair loss, on the other hand, isn't a standard diabetes symptom and can arise from many other causes, so it doesn't fit the usual pattern of diabetes signs. That's why hair loss is the best choice for something not listed as a diabetes symptom.

7. What is lactose intolerance and how does it relate to lactase persistence in humans?

- A. Lactase non-persistence means continued lactase production into adulthood.
- B. Lactase persistence leads to lactose intolerance in adulthood.
- C. Lactase non-persistence leads to lactose intolerance after weaning; lactase persistence allows continued digestion of lactose into adulthood.**
- D. Lactase persistence has no impact on lactose digestion.

Lactase is the enzyme in the small intestine that breaks lactose into glucose and galactose. In many people, lactase production declines after weaning, so adults may not digest lactose well and can experience diarrhea, gas, and bloating when dairy is consumed. When someone has lactase persistence, lactase production continues into adulthood, allowing continued digestion of lactose from dairy foods without those symptoms. This is why the statement that lactase non-persistence leads to lactose intolerance after weaning, while lactase persistence allows continued digestion of lactose into adulthood, best explains the relationship. The other ideas mix up the direction of the effect or assert no impact of persistence, which doesn't fit the biology.

8. What is the evolutionary advantage of the rabies virus's manipulation that causes aggression and frothing at the mouth?

- A. It promotes biting and spread of the virus via saliva.**
- B. It increases the host's ability to resist other infections.
- C. It directly increases the host's lifespan to prolong infection.
- D. It reduces the host's aggression, allowing stealthy spread.

Pathogens evolve traits that maximize transmission between hosts. For rabies, the virus manipulates the host to become aggressive and produce a lot of saliva. The key transmission route is through bites, where virus-laden saliva enters a new host. By making the host more prone to biting and by increasing salivation, the virus is more likely to spread when contact with another animal occurs. The virus travels from the entry site to the brain and then to the salivary glands, ensuring it is shed in saliva during a bite. This tactic pays off even if the infection harms the host, because the crucial step for spread is a bite, not extending the host's life or reducing aggression.

9. Which statement best describes heterozygotes for thalassemia in malaria-endemic regions?

- A. They have enhanced malaria resistance without severe disease.**
- B. They have no advantage and only burden.
- C. They have more severe anemia than homozygotes.
- D. They have higher malaria susceptibility.

In malaria-endemic regions, carrying one defective thalassemia gene (being a heterozygote) often provides a survival advantage. Their red blood cells are less favorable for the malaria parasite to thrive, which can reduce the risk of severe malaria, while not causing the severe anemia seen in individuals with two defective genes. This is a classic example of heterozygote advantage or balanced polymorphism, where the carrier state offers protection in the local disease environment. So the best description is that heterozygotes have enhanced malaria resistance without developing severe thalassemia symptoms. The other statements don't fit because carriers typically do gain some protection, don't experience more severe anemia than those with two defective genes, and are not more susceptible to malaria.

10. What modern health risks are associated with unmanaged hemochromatosis?

- A. Liver damage, diabetes, heart problems, hormonal issues, and joint problems when iron overload is not managed.**
- B. Only liver damage.
- C. Only diabetes.
- D. No health risks.

Iron overload damages multiple organs when it isn't managed, which is why unmanaged hemochromatosis is linked to a range of modern health risks. The liver is a primary target, and excess iron can lead to fibrosis and cirrhosis over time, increasing the risk of liver cancer. The pancreas can be harmed too, reducing insulin production and raising the likelihood of developing diabetes. The heart may suffer from iron-induced cardiomyopathy and rhythm problems, which can lead to heart failure. Endocrine glands aren't spared, so hormonal problems such as hypogonadism can occur, affecting fertility and other hormone-related functions. Joints can also be affected, causing chronic joint pain and stiffness from iron deposition in the joints. With effective management like regular phlebotomy to lower iron levels, these risks are reduced, but if iron remains high, these multisystem issues are common.

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://survivalofthesickest.examzify.com>

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

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