

MASTERING BIOLOGY PRACTICE TEST (SAMPLE)

STUDY GUIDE



Prepare with structure. Pass with confidence



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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. Approximately how many 15-19-year-old males were there in China in 2010?**
 - A. 56 million
 - B. 30 million
 - C. 90 million
 - D. 120 million
- 2. Which statement best describes character displacement in ecology?**
 - A. Increase in similarity to share resources
 - B. Divergence in a trait that reduces competition
 - C. No change in traits
 - D. Random trait changes
- 3. White-band disease in Caribbean coral reef communities is best described as which type of ecological effect?**
 - A. A local, isolated effect affecting only coral
 - B. A cascade event that shifts the entire makeup of the community
 - C. A short-term fluctuation with no long-term effects
 - D. A pathogen that increases species richness
- 4. Which population size has the highest growth rate among those above carrying capacity?**
 - A. 1500
 - B. 1520
 - C. 1530
 - D. 1510
- 5. Stabilizing selection is best described as**
 - A. Favors extremes
 - B. Favors intermediate phenotypes, reducing extremes
 - C. Favors late-acting alleles
 - D. Increases variance

- 6. In an ecosystem, phytoplankton are which trophic level?**
- A. Decomposers
 - B. Primary consumers
 - C. Producers
 - D. Secondary consumers
- 7. In a country, in 1970 average age of childbearing was 28 and average offspring per woman was 3. In 1980, average age of childbearing remained 28 but average offspring per woman dropped to 2, with death rate constant. How did the population growth rate change from 1970 to 1980?**
- A. Decreased
 - B. Increased
 - C. Could not be determined
 - D. Stayed the same
- 8. In populations where two species compete, natural selection due to interspecific competition is most evident in which context?**
- A. In allopatric populations only
 - B. In both allopatric and sympatric populations
 - C. In neither context
 - D. In sympatric populations only
- 9. Disturbances creating patches of different habitat types across a landscape are described by which concept?**
- A. Niche differentiation
 - B. Ecological succession
 - C. Trophic cascade
 - D. Habitat mosaic
- 10. Environmental heterogeneity in a landscape most directly contributes to**
- A. Higher beta diversity due to diverse habitats
 - B. Lower gamma diversity
 - C. More uniform species distribution
 - D. Decreased species richness

Answers

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

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Explanations

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1. Approximately how many 15-19-year-old males were there in China in 2010?

- A. 56 million**
- B. 30 million
- C. 90 million
- D. 120 million

Think about how population is distributed by age and sex. In a country as large as China in 2010, the five-year window from 15 to 19 years old represents a substantial cohort, spread across both sexes. The total number of people in this age range across both sexes is on the order of about a hundred million. Since roughly half of the population in adolescence is male, and there is a slight male bias at birth that persists into adolescence, the number of males in this five-year group ends up a bit more than half of that total—roughly 56 million. The other options would imply a breakdown that's too small or too large for this large year-and-age segment, given the overall population size and typical age distribution in 2010.

2. Which statement best describes character displacement in ecology?

- A. Increase in similarity to share resources
- B. Divergence in a trait that reduces competition**
- C. No change in traits
- D. Random trait changes

Character displacement happens when species that live in the same area evolve differences in a trait to minimize competition for shared resources. When two species rely on similar resources, natural selection pushes them to use different parts of the niche, leading to divergence in traits like beak size, body shape, or feeding behavior. This divergence reduces direct competition and allows both species to coexist. A classic example is differences in beak size among related birds on islands where they share food resources. If species are separated and don't compete, their traits may stay similar, and there's less or no pressure to diverge. Random changes or a tendency to become more similar don't explain this pattern. So the statement that best describes character displacement is divergence in a trait that reduces competition.

3. White-band disease in Caribbean coral reef communities is best described as which type of ecological effect?

- A. A local, isolated effect affecting only coral
- B. A cascade event that shifts the entire makeup of the community
- C. A short-term fluctuation with no long-term effects
- D. A pathogen that increases species richness**

Disturbances like disease can trigger cascades that ripple through an ecosystem, changing not just the target species but the entire community and how it functions. White-band disease kills corals rapidly, removing the physical structure and habitat that many other organisms rely on. As corals decline, reef complexity drops, leading to shifts in which species thrive—for example, more algae may take over, and fish and invertebrate communities that depended on live coral can decline. This chain of effects shows how a disease can cascade through trophic relationships and habitat structure, altering the overall makeup of the reef community over the long term. It isn't simply a localized, short-term hit to one species, nor is it a pathogen that increases species richness.

4. Which population size has the highest growth rate among those above carrying capacity?

- A. 1500
- B. 1520
- C. 1530
- D. 1510**

When a population exceeds carrying capacity, resources become limiting and the population tends to decline toward the carrying capacity. In this situation the growth rate dN/dt is negative, and the further above carrying capacity a population is, the larger (in magnitude) that negative rate becomes. Among sizes above carrying capacity, the one closest to carrying capacity declines the least quickly and thus has the highest growth rate (the least negative dN/dt). Here, if carrying capacity is 1500, then 1510 is the smallest population above it, so it experiences the smallest decline compared with 1520 and 1530. The value at 1500 is at carrying capacity, not above, so it isn't in this group. So 1510 has the highest growth rate among those above carrying capacity.

5. Stabilizing selection is best described as

- A. Favors extremes
- B. Favors intermediate phenotypes, reducing extremes**
- C. Favors late-acting alleles
- D. Increases variance

Stabilizing selection reduces trait variance by favoring intermediate phenotypes and penalizing the extremes. Think of a trait where the average value confers the highest fitness, while individuals with values far from the mean have lower survival or reproductive success. That pushes the population toward the middle and trims off the tails of the distribution, keeping the average around the same but making individuals more similar in that trait. A classic example is birth weight: babies near the average weight have higher survival than those who are very small or very large, so intermediate weights are favored and variation around the mean decreases. This is different from directional selection, which shifts the mean toward one extreme, and from disruptive selection, which increases variation by favoring both extremes. Stabilizing selection does not increase variance; it reduces it for the trait under selection.

6. In an ecosystem, phytoplankton are which trophic level?

- A. Decomposers
- B. Primary consumers
- C. Producers**
- D. Secondary consumers

Phytoplankton are photosynthetic organisms that convert sunlight into organic matter, forming the base of the aquatic food web. Because they produce their own energy, they occupy the producer level, the first step in energy flow that feeds all other levels. Decomposers break down dead material, primary consumers eat producers, and secondary consumers eat primary consumers, so phytoplankton don't fit those roles. In short, their ability to synthesize organic matter from light makes them the producers.

7. In a country, in 1970 average age of childbearing was 28 and average offspring per woman was 3. In 1980, average age of childbearing remained 28 but average offspring per woman dropped to 2, with death rate constant. How did the population growth rate change from 1970 to 1980?

A. Decreased

B. Increased

C. Could not be determined

D. Stayed the same

The key idea is that population growth rate depends on births minus deaths, so with the death rate staying the same, changes in births directly affect growth. Here, the average number of children per woman drops from 3 to 2, meaning fewer births occur. Since when births fall and deaths are unchanged the net gain in population shrinks, the growth rate declines. The fact that the average age of childbearing remains the same means births aren't being shifted earlier or later to offset the drop, so there's no compensating effect. Therefore, the population growth rate decreases.

8. In populations where two species compete, natural selection due to interspecific competition is most evident in which context?

A. In allopatric populations only

B. In both allopatric and sympatric populations

C. In neither context

D. In sympatric populations only

Natural selection due to interspecific competition occurs where species coexist and compete for the same resources. In allopatric populations, the species live in separate areas and do not interact, so there is no competition between them to drive changes. In sympatric populations, the two species share the same space and resources, creating direct competition and selecting for traits that reduce overlap or give one species an advantage. This leads to observable changes like character displacement, where differences between species become more pronounced in areas of contact. So the phenomenon is most evident in sympatric populations.

9. Disturbances creating patches of different habitat types across a landscape are described by which concept?

A. Niche differentiation

B. Ecological succession

C. Trophic cascade

D. Habitat mosaic

A habitat mosaic captures how disturbances create a landscape pattern of patches with different habitat types. This patchwork arises as some areas are opened up by events like fire, windthrow, or flood, while others remain intact or regenerate differently, producing variety in vegetation structure, moisture, and resources. That spatial variety provides a range of microhabitats and edge environments, influencing which species can persist and how they move across the landscape. This idea is distinct from niche differentiation, which describes how species partition resources within a habitat; from ecological succession, which deals with the temporal sequence of community change after disturbance; and from trophic cascades, which involve indirect effects spreading through food webs.

10. Environmental heterogeneity in a landscape most directly contributes to

A. Higher beta diversity due to diverse habitats

B. Lower gamma diversity

C. More uniform species distribution

D. Decreased species richness

Environmental heterogeneity creates a mosaic of distinct habitats, each with its own conditions and resources. Because species have different adaptations and niche requirements, the community composition varies from one patch to another. This turnover in species from place to place is beta diversity—the measure of how different communities are across the landscape. While alpha diversity is the richness within a single habitat and gamma diversity is the total richness across the landscape, the direct consequence of having varied habitats is an increase in beta diversity. The other options don't fit as closely: heterogeneity doesn't inherently produce uniform distributions, nor does it necessarily decrease overall species richness, and while it can influence gamma, the most direct effect is the greater difference among habitat-specific communities.

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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://masteringbiology.examzify.com>

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

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