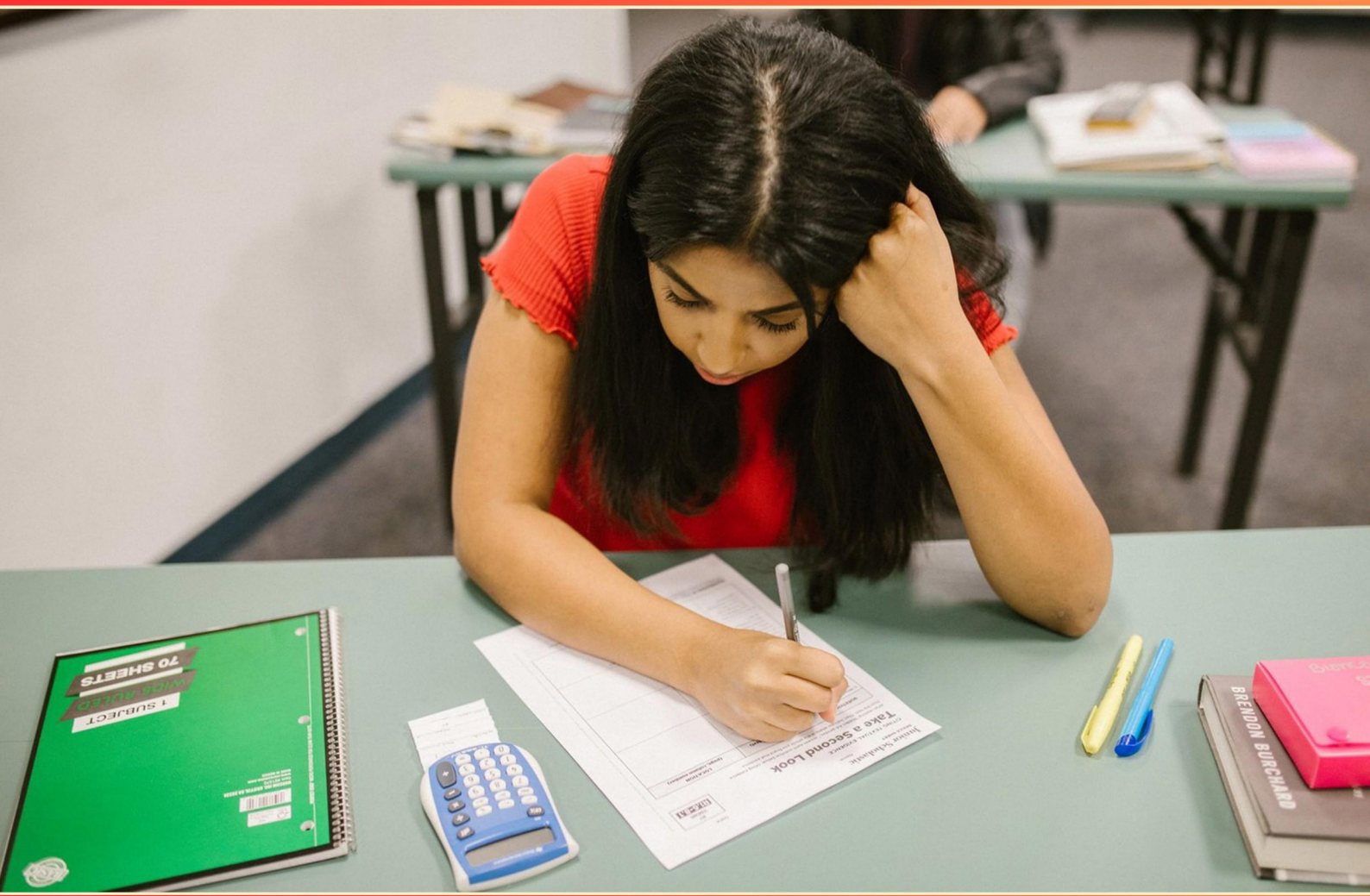
POPULATIONS EXAM 6 PRACTICE (SAMPLE)

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

1. What is the relationship between sample size and the power to detect differentiation or selection?

A. Larger sample size reduces power.

B. Larger sample size increases power.

C. Sample size does not affect power.

D. Power depends only on allele frequencies.

2. Distinguish between overdominance and frequency-dependent selection as forms of balancing selection.

A. Overdominance maintains both alleles because heterozygotes have higher fitness; frequency-dependent selection maintains alleles because their fitness depends on their frequency

B. Both maintain alleles only via the same mechanism

C. Neither can maintain genetic variation

D. Overdominance reduces genetic variation

3. Which statement correctly describes the nature of disasters?

A. They are geological or meteorological occurrences

B. They are caused only by human error

C. They are unpredictable and have no patterns

D. They are purely biological events

4. Which formula correctly expresses p′ under selection given p, q, and fitnesses w_AA, w_Aa, w_aa?

A. p′ = [p^2 w_AA + p q w_Aa] / Wbar where Wbar = p^2 w_AA + 2 p q w_Aa + q^2 w_aa.

B. p′ = p^2 w_AA / Wbar

C. p′ = p + q

D. p′ = p w_AA / (p w_AA + q w_aa)

5. Before a disaster, which safety action should be taken to keep exits clear?

A. Remove boxes blocking exits

B. Keep boxes blocking exits

C. Move boxes into doorways

D. Place boxes in front of exits

6. Which of the following is an example of health promotion and self-care family function and structure?

A. Families learning about the importance of taking care of their health

B. Nurses teaching individual clinical skills to patients

C. Policy development at the community level

D. Hospitals expanding bed capacity

7. Which factors commonly cause Ne to be smaller than census size?

A. Unequal sex ratio, variation in family size, fluctuating population size, overlapping generations.

B. Equal sex ratio, constant population size, monogamy.

C. Large, stable populations with random mating.

D. High mutation rate.

8. In mutation–selection balance, would the deleterious allele frequency remain constant across generations?

A. Yes, at a stable equilibrium frequency

B. No, it continually increases without bound

C. It becomes 1 due to mutation input

D. No, it goes to zero immediately

9. Which factor may drive the decision to use SNPs over microsatellites for a large-scale survey?

A. SNPs provide abundant genome-wide coverage.

B. Microsatellites provide more markers across the genome.

C. SNPs are always cheaper per genotype.

D. Microsatellites are stable across populations.

10. In which phase of the disaster management cycle is a nurse assessing vulnerabilities across the community?

A. Prevention/mitigation

B. Preparedness

C. Response

D. Recovery

Answers

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

Explanations

1. What is the relationship between sample size and the power to detect differentiation or selection?

A. Larger sample size reduces power.

B. Larger sample size increases power.

C. Sample size does not affect power.

D. Power depends only on allele frequencies.

The main idea is statistical power—the ability to detect a real difference or a real signal of selection when it exists. When you sample more individuals, your estimates of allele frequencies become more precise because the sampling error shrinks. This means the true difference in frequencies between populations, or the true signal of selection, is less likely to be masked by random noise. As a result, the test is more likely to reject the null hypothesis when there really is differentiation or selection, increasing power. In short, larger samples give you clearer, more reliable estimates, making it easier to detect real differences or selective effects. Remember that power also depends on how big the true effect is and on allele frequencies; very small effects require even larger samples to achieve high power, and there are diminishing returns at very large sizes, but the overall relationship is positive.

2. Distinguish between overdominance and frequency-dependent selection as forms of balancing selection.

A. Overdominance maintains both alleles because heterozygotes have higher fitness; frequency-dependent selection maintains alleles because their fitness depends on their frequency

B. Both maintain alleles only via the same mechanism

C. Neither can maintain genetic variation

D. Overdominance reduces genetic variation

Balancing selection keeps multiple alleles in a population by different mechanisms. In overdominance, the heterozygote genotype has higher fitness than either homozygote, so both alleles are maintained at stable frequencies because offspring with the heterozygous combination are favored. This directly preserves genetic variation since neither allele is lost. In frequency-dependent selection, an allele's fitness depends on how common it is in the population. When an allele is rare, it has a fitness advantage; as it becomes more frequent, its advantage diminishes. This negative frequency dependence prevents any one allele from sweeping to fixation and can maintain a polymorphism or even cause cycles in allele frequencies over time. So, overdominance maintains both alleles via heterozygote advantage, while frequency-dependent selection maintains alleles because their fitness changes with how common or rare they are.

3. Which statement correctly describes the nature of disasters?

A. They are geological or meteorological occurrences

B. They are caused only by human error

C. They are unpredictable and have no patterns

D. They are purely biological events

Disasters are best understood as events rooted in natural Earth processes—geological forces such as earthquakes, landslides, and volcanic eruptions, and meteorological extremes like storms, floods, and droughts. This view captures the broad range of events that cause harm and disruption, which is why describing disasters as geological or meteorological occurrences is the most accurate. Human factors can amplify impacts, and some disasters involve biological aspects, but the fundamental nature lies in natural processes rather than being caused solely by human error, being entirely unpredictable, or being purely biological.

4. Which formula correctly expresses p' under selection given p, q, and fitnesses w_AA, w_Aa, w_aa?

A. p' = [p^2 w_AA + p q w_Aa] / Wbar where Wbar = p^2 w_AA + 2 p q w_Aa + q^2 w_aa.

B. p' = p^2 w_AA / Wbar

C. p' = p + q

D. p' = p w_AA / (p w_AA + q w_aa)

Selection changes allele frequencies by weighting each genotype by its fitness and then normalizing by the population's average fitness. Before selection, genotype frequencies are p^2, 2pq, and q^2. After selection, survivors occur in proportions p^2 w_AA, 2pq w_Aa, and q^2 w_aa, and the mean fitness is Wbar = p^2 w_AA + 2pq w_Aa + q^2 w_aa. The frequency of the A allele among survivors is the weighted count of A alleles: p' = [p^2 w_AA + pq w_Aa] / Wbar, since AA contributes two A alleles and Aa contributes one A allele. This gives the correct expression for p' after selection.

5. Before a disaster, which safety action should be taken to keep exits clear?

A. Remove boxes blocking exits

B. Keep boxes blocking exits

C. Move boxes into doorways

D. Place boxes in front of exits

The main idea is that in an emergency, you need a clear path to exit. Keeping exits unobstructed lets people evacuate quickly and safely and prevents trips or bottlenecks as they move toward safety. Removing boxes or other objects that block exit routes is the best action because it immediately opens the way for everyone to get out and for responders to reach the area if needed. Leaving things in doorways or in front of exits creates chokepoints and can trap people, dramatically increasing risk. So the correct approach is to remove anything blocking exits to keep those routes open.

6. Which of the following is an example of health promotion and self-care family function and structure?

A. Families learning about the importance of taking care of their health

B. Nurses teaching individual clinical skills to patients

C. Policy development at the community level

D. Hospitals expanding bed capacity

This item centers on health promotion and self-care within the family unit—the idea that families can actively learn about health, adopt preventive routines, and support one another in managing care at home. When families learn about the importance of taking care of their health, they build shared knowledge and practices, establish healthy routines, and encourage each other to engage in preventive behaviors and self-management. This reflects health promotion embedded in family life and the way the family supports its members' ongoing well-being. The example that fits best describes families collectively learning about health and how to care for themselves, which strengthens their ability to maintain good health together. The other scenarios involve education or actions at broader levels or different targets: teaching individual clinical skills to patients focuses on the patient rather than the family unit; policy development at the community level involves public policy and population health; hospitals expanding bed capacity relates to health system resources rather than family self-care and functioning.

7. Which factors commonly cause Ne to be smaller than census size?

A. Unequal sex ratio, variation in family size, fluctuating population size, overlapping generations.

B. Equal sex ratio, constant population size, monogamy.

C. Large, stable populations with random mating.

D. High mutation rate.

Ne is the number of individuals that effectively contribute genes to the next generation, and it tends to be smaller than the census size when reproduction is uneven or occurs across time in a way that concentrates genetic contributions. Unequal sex ratio reduces the pool of breeders because if one sex is underrepresented, there are fewer individuals passing on genes than the total counted in the population. For example, many more females than males (or vice versa) means the actual breeding pair pool is smaller than the total population. Variation in family size also lowers Ne. When some individuals have many offspring while others have few or none, genetic drift has a stronger effect because a small subset of the population drives most of the gene flow to the next generation. Fluctuations in population size over time reduce Ne through the harmonic mean effect. If the population undergoes bottlenecks or large swings, the years with small census size dominate the long-term genetic contribution, pulling Ne below the census size. Overlapping generations contribute to a smaller Ne because multiple age cohorts breed simultaneously, spreading genetic contributions across a longer time and effectively reducing the number of breeders that pass genes in a given generation. In contrast, a balanced sex ratio with stable population size and random mating tends to push Ne closer to the census size, and a high mutation rate doesn't directly set Ne, though it influences genetic variation.

8. In mutation–selection balance, would the deleterious allele frequency remain constant across generations?

A. Yes, at a stable equilibrium frequency

B. No, it continually increases without bound

C. It becomes 1 due to mutation input

D. No, it goes to zero immediately

Mutation–selection balance is about a steady tug-of-war: new deleterious alleles keep arising each generation through mutation, while natural selection removes the copies that reduce fitness. When mutation rate and selection pressure are constant, these forces balance, so the deleterious allele settles at a small but nonzero frequency and stays roughly constant from generation to generation. It won't keep increasing without bound because selection removes the worse genotypes, and it won't vanish immediately because mutation continually reintroduces new copies. It also won't fix in the population since that would require removing all copies, which selection against deleterious alleles opposes. The result is a stable equilibrium frequency.

9. Which factor may drive the decision to use SNPs over microsatellites for a large-scale survey?

A. SNPs provide abundant genome-wide coverage.

B. Microsatellites provide more markers across the genome.

C. SNPs are always cheaper per genotype.

D. Microsatellites are stable across populations.

Dense, genome-wide coverage that can be produced at large scale is the factor driving the choice toward SNPs for a big survey. There are millions of SNP sites spread across the genome, and modern genotyping platforms can assay hundreds of thousands to millions of SNPs in a single run for each individual. This dense, uniform coverage lets researchers capture population structure, admixture, and selection signals across the entire genome, and it pairs well with high-throughput workflows and automated data processing. It also enables imputation to even higher density using reference panels, boosting information content without re genotyping every site. Microsatellites, while highly polymorphic, don't offer the same practical genome-wide coverage for huge studies. They're less uniformly distributed, harder to score consistently across thousands of samples, and their higher mutation rates can complicate comparisons between populations. These factors make large-scale, genome-wide surveys much more cumbersome with microsatellites. Price per genotype can vary and isn't the sole driver, but the key idea is that SNPs provide the scalable, comprehensive genome-wide data needed for large surveys.

10. In which phase of the disaster management cycle is a nurse assessing vulnerabilities across the community?

A. Prevention/mitigation

B. Preparedness

C. Response

D. Recovery

Identifying and reducing risk before harm occurs is the focus here. When a nurse surveys the community to find who is most vulnerable, where gaps in access or protective factors exist, and what hazards pose the greatest threat, they're laying groundwork to lessen impact before a disaster hits. This is the essence of prevention/mitigation: anticipating hazards, assessing community vulnerabilities, and implementing measures to reduce exposure or susceptibility. For example, mapping areas with poor housing, high elderly populations, or limited transportation helps target interventions like risk-reduction measures, outreach, or infrastructure improvements. Preparedness would involve planning, training, and stocking resources to support those efforts, while response and recovery center on actions during and after the event. So, assessing vulnerabilities across the community aligns with prevention/mitigation.

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://populationsexam6.examzify.com

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