BIOLOGY 30 GENETICS 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

1. Which term refers to a body cell, or non-sex cell?

A. Germ cell

B. Stem cell

C. Somatic cell

D. Gamete

2. Which term describes a picture of an organism's genome used for chromosomal analysis?

A. Genome

B. Karyotype

C. Chromosome count

D. Nucleoid image

3. In a dihybrid cross AaBb x AaBb, classic phenotypic ratio?

A. 1:1:1:1

B. 9:3:3:1

C. 3:1

D. 2:2:2:2

4. What is the term for a mutation that involves the loss of all or part of a chromosome?

A. Duplication chromosomal mutation

B. Deletion chromosomal mutation

C. Inversion chromosomal mutation

D. Translocation chromosomal mutation

5. What is incomplete dominance? Give the genotype-phenotype example.

A. One allele completely masks the other in heterozygotes.

B. Heterozygotes show an intermediate phenotype; example: RR red, rr white, Rr pink.

C. Alleles do not affect phenotype.

D. Heterozygotes show both traits simultaneously; example AB blood type (IA IB).

6. An individual with an extra copy of a chromosome is described as having what?

A. Trisomy

B. Polyploidy

C. Nondisjunction

D. Genetic Engineering

7. The process of making changes in the DNA code of living organisms is called?

A. DNA Profiling

B. Genetic Engineering

C. GMO

D. Polyploidy

8. Explain the role of restriction enzymes in cloning.

A. They cut DNA at specific sequences to create compatible ends for joining DNA fragments into vectors.

B. They synthesize DNA to create copies of genes.

C. They ligate DNA fragments together.

D. They modify histones to control gene expression.

9. In genetics, what term describes the possibility or likelihood of outcomes?

A. Ratio

B. Probability

C. Phenotype

D. Genotype

10. An organism that has two identical alleles for a trait is called what?

A. Heterozygous

B. Homozygous

C. Allele

D. Genotype

Answers

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

Explanations

1. Which term refers to a body cell, or non-sex cell?

A. Germ cell

B. Stem cell

C. Somatic cell

D. Gamete

Distinguishing body (non-sex) cells from reproductive cells. A body cell is called a somatic cell. These cells make up tissues and organs and divide by mitosis to grow and repair the organism. They are typically diploid, carrying two sets of chromosomes, and are not used to form gametes. Germ cells, on the other hand, are the cells that give rise to gametes and are part of the reproductive lineage. Gametes themselves are the sex cells (sperm or egg) and are haploid. Stem cells are undifferentiated cells that can become various cell types, but the term somatic specifically refers to the non-reproductive body cells, which is what the question is asking about.

2. Which term describes a picture of an organism's genome used for chromosomal analysis?

A. Genome

B. Karyotype

C. Chromosome count

D. Nucleoid image

In chromosomal analysis, the organized image of all chromosomes from a cell is called a karyotype. A karyotype shows the number and appearance of chromosomes, typically arranged in pairs by size and banding pattern, and is prepared from cells arrested in metaphase and stained to reveal characteristic bands. This visual snapshot allows scientists to detect abnormalities such as extra or missing chromosomes, translocations, or structural changes. The other terms don't fit as well: a genome refers to the entire set of genetic material, not a single chromosomal image; chromosome count is just the total number of chromosomes and doesn't capture their size or structure; and a nucleoid image describes bacterial DNA organization, not the eukaryotic chromosome arrangement used in standard chromosomal analysis.

3. In a dihybrid cross AaBb x AaBb, classic phenotypic ratio?

A. 1:1:1:1

B. 9:3:3:1

C. 3:1

D. 2:2:2:2

Two genes with independent assortment and complete dominance produce a dihybrid phenotypic pattern. For each gene, Aa x Aa gives a 3:1 phenotypic split (dominant to recessive). Because the two genes assort independently, multiply the probabilities for combined phenotypes. - Dominant for both traits: 3/4 × 3/4 = 9/16 - Dominant for one trait, recessive for the other: 3/4 × 1/4 = 3/16 (two such cases) - Recessive for both traits: 1/4 × 1/4 = 1/16 Putting these together gives a 9:3:3:1 phenotypic ratio. This is the classic result for a dihybrid cross under independent assortment and complete dominance.

4. What is the term for a mutation that involves the loss of all or part of a chromosome?

A. Duplication chromosomal mutation

B. Deletion chromosomal mutation

C. Inversion chromosomal mutation

D. Translocation chromosomal mutation

Loss of genetic material from a chromosome is called a deletion. This mutation means all or part of the chromosome is missing, so fewer genes are present in that region. Deletions can occur at the end of a chromosome (terminal) or within the chromosome (interstitial), and they can have significant effects depending on which genes are lost. In contrast, duplications add extra copies of a chromosome segment, inversions flip a segment's order without removing material, and translocations move a segment to a different chromosome or location. A classic example of a deletion-related condition is Cri du chat, caused by a missing piece of chromosome 5.

5. What is incomplete dominance? Give the genotype-phenotype example.

A. One allele completely masks the other in heterozygotes.

B. Heterozygotes show an intermediate phenotype; example: RR red, rr white, Rr pink.

C. Alleles do not affect phenotype.

D. Heterozygotes show both traits simultaneously; example AB blood type (IA IB).

Incomplete dominance is when the heterozygous genotype produces a phenotype that is intermediate between the two homozygous phenotypes because neither allele fully masks the other. An example uses color: red is produced by one allele, white by the other, so RR plants are red, rr plants are white, and Rr plants are pink. This shows a blending effect where the heterozygote sits between the two extremes. This differs from complete dominance, where the heterozygote looks like one of the homozygotes, and from codominance, where the heterozygote displays both traits at once (as with AB blood type having both A and B antigens).

6. An individual with an extra copy of a chromosome is described as having what?

A. Trisomy

B. Polyploidy

C. Nondisjunction

D. Genetic Engineering

Trisomy refers to having three copies of a particular chromosome in a cell. In humans, normal cells are diploid with two copies of each chromosome, so when one chromosome is present in three copies, that chromosome is trisomic. A familiar example is trisomy 21, which leads to Down syndrome. Polyploidy would mean having three or more complete sets of all chromosomes (not just one chromosome extra), so it's a different situation. Nondisjunction is the error during cell division that can produce trisomy by failing to separate chromosome copies, but the resulting condition is described as trisomy. Genetic engineering, meanwhile, involves deliberate modification of genes and not simply an abnormal chromosome count.

7. The process of making changes in the DNA code of living organisms is called?

A. DNA Profiling

B. Genetic Engineering

C. GMO

D. Polyploidy

Making intentional changes to an organism's DNA is genetic engineering. It involves methods that add, remove, or alter genes to achieve a desired trait or outcome, such as inserting a gene from one species into another or editing a gene with CRISPR. This is about changing the genetic code itself, not just reading it. DNA profiling, by contrast, focuses on identifying and comparing DNA sequences to establish identity or relationships, not altering genetic material. A GMO is the organism that results from genetic engineering—the product, not the process. Polyploidy refers to having extra sets of chromosomes, a chromosomal change rather than a gene-by-gene modification of the DNA code.

8. Explain the role of restriction enzymes in cloning.

A. They cut DNA at specific sequences to create compatible ends for joining DNA fragments into vectors.

B. They synthesize DNA to create copies of genes.

C. They ligate DNA fragments together.

D. They modify histones to control gene expression.

Restriction enzymes cut DNA at specific sequences, creating fragments with ends that can be joined together. In cloning, you cut both the cloning vector (like a plasmid) and the DNA fragment you want to insert with matching enzymes so their ends are compatible. If the cuts produce sticky ends, the overhangs pair through base pairing, guiding the fragment into the vector; blunt ends can also be joined but require more effort. After cutting, DNA ligase seals the backbones, producing a stable recombinant DNA molecule that can be introduced into a host organism for propagation or expression. This role—creating compatible ends for joining fragments into vectors—is why restriction enzymes are essential in cloning.

9. In genetics, what term describes the possibility or likelihood of outcomes?

A. Ratio

B. Probability

C. Phenotype

D. Genotype

Probability is about how likely different outcomes are. In genetics, it tells us the chance that a cross will produce certain genotypes or phenotypes, based on the alleles the parents carry. For example, when two heterozygotes are crossed, the Punnett square shows the possible allele combinations and their probabilities (like 1/4 for a particular genotype, 1/2 for another), letting us predict what fraction of offspring we expect to see. The other terms describe what we observe or inherit: a ratio expresses the relative frequencies after many offspring, a phenotype is the visible trait, and a genotype is the actual genetic makeup. So the term that describes the possibility or likelihood of outcomes is probability.

10. An organism that has two identical alleles for a trait is called what?

A. Heterozygous

B. Homozygous

C. Allele

D. Genotype

Having two identical alleles for a trait means the organism is homozygous for that gene. This means the two copies of the gene carry the same allele, such as BB or bb. The opposite situation is heterozygous, where the two alleles are different (like Bb). An allele is one version of a gene, while the genotype is the pair of alleles an organism has for that gene—whether they are the same (homozygous) or different (heterozygous).

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://bio30genetics.examzify.com

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