Biology Spring Final Exam Preview

Name: _____ Hour_____ Date:_____ Score:_____ / 34

Background Information: Green anoles are a type of lizard that live in the southeastern United States. They tend to be 4 to 8 cm (1.5-3 in) long, and primarily live in tree branches. In light, green anoles are bright green.

1. **How does the green anole's DNA determine its traits (such as its green coloration)? (3 pts)**

Score
_____/3
□ Complete
□ Accurate
□ Precise

_____

_____

_____

HINT: A successful response will clearly explain how both DNA and proteins affect an organism's traits.

2. **How does mitosis affect the cells of the green anole?**
   a. XXX
   b. XXX
   c. XXX
   d. XXX

3. **How does meiosis affect the cells of the green anole?**
   a. XXX
   b. XXX
   c. XXX
   d. XXX

4. Mate A is [homozygous OR heterozygous] for a recessive albino mutation that makes it white instead of green. Mate B is [homozygous OR heterozygous] for this mutation. **Which of the following claims would be accurate?**
   a. Both are albino (white)
   b. Both are green.
   c. Mate A is white and Mate B is green.
   d. Mate A is green and Mate B is white.

5. **What are the odds that the offspring of Mate A and Mate B will be albino (white)? Defend your claim using a Punnett square** *(1 pt for correct option; 1 pt for correct Punnett square).*
   a. XXX
   b. XXX
   c. XXX
   d. XXX

Page Score: _____/ 8

6. **How do cells use DNA to assemble proteins (such as the green pigment proteins in the green anole)? Summarize what occurs during transcription & translation in your response**. (3 pts)

Score

_____/3
□ Complete
□ Accurate
□ Precise

HINT: A successful response will clearly explain what occurs during transcription and translation within a cell.

7. This albino mutation is due to the substitution of one base for another in that specific gene. **Why would the entire trait change if only one base in the gene was changed?** (3 pts)
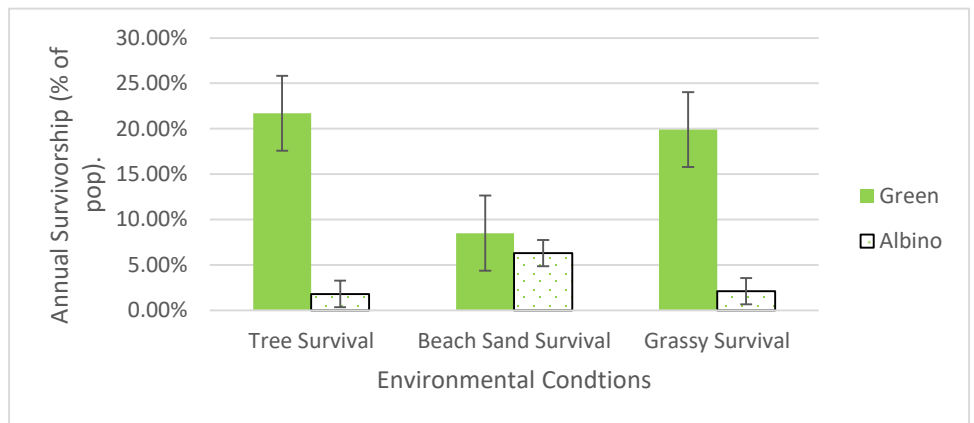
Score

_____/3
□ Complete
□ Accurate
□ Precise

HINT: How does changing one base in DNA affect codons, amino acids, and protein assembly? How does this change the protein's shape and function?

Researchers measured the percentage of green and white anoles who survived over a period of one year. They measured survivorship rates in three different environments: *trees, sandy beaches, and tall grass*.

8. **Which of the following claims are fully supported by this data?**
   a. XXX
   b. XXX
   c. XXX
   d. XXX

9. **Is this an example of natural selection and/or evolution?** Justify your claims with evidence. (3 pts)

Score

_____/3
□ Complete
□ Accurate
□ Precise

HINT: What is the difference between natural selection and evolution? How do we know when each is occurring?

Page Score: _____ / 10

Background: Green anoles (*shown above*) are being displaced by a similar species of lizard from the Caribbean called the brown anole (*shown below*). They live in similar habitats and eat similar food as the green anoles. Brown anoles also eat the newly hatched babies of green anoles.

Scientists were unsure how the presence of the brown anoles would affect the green anoles. They predicted that the introduction of the brown anoles would increase the rate of change in the green anole's adaptations. They thought this because both the presence of the brown anoles would increase competition for food and survival.

To test this hypothesis, scientists introduced brown anoles to three islands. Next, they collected data on a) the average height at which green anoles were found in trees (perch height); b) the average size of the green anole's toe pads; and c) the average number of sticky scales on their feet. They then measured whether these traits changed in response to the introduction of the brown anole. The researcher's data is shown on the next page. *Use the information provided here to answer the questions below (1 pt each).*

10. **What is their research question?** _____

11. **What is their hypothesis?** _____

12. **What is their rationale?** _____

13. **What is their independent variable(s)?** _____

14. **What is their dependent variable(s)?** _____

15. **What is their control?** _____

16. **What is something these researchers could do to improve the validity of their data?**

Page Score: _____ / 7

	Green Anoles on an Island WITHOUT Brown Anoles	Green Anoles on an Island WITH Brown Anoles
Average Perch Height in Trees	XX cm	XX cm
Average Size of the Toe pads	XX cm	XX cm (X% increase)
Avg. Number of Sticky Scales on Feet	XX sticky scales	XX sticky scales (X% increase)

17. **How were the green anole's traits different between islands with brown anoles compared to those without brown anoles? What caused new traits to emerge in some of the green anoles?** (3 pts)

Score

_____/3
□ Complete
□ Accurate
□ Precise

HINT: Where do new traits come from? How do new traits emerge in species?

18. Invasive species like the brown anole generally reduce biodiversity in ecosystems. **How does the loss of biodiversity affect A) ecosystem services and B) ecosystem resilience? Explain**. (3 pts)

Score

_____/3
□ Complete
□ Accurate
□ Precise

HINT: What do these terms mean? And how do changes to biodiversity affect ecosystem services and resilience?

19. Human activity has affected biodiversity throughout the world. **Using the data below, A) predict how biodiversity will change throughout your life. B) Then explain how this will affect your life**. (3 pts)

Score

_____/3
□ Complete
□ Accurate
□ Precise

Species Extinctions Since 1800