

Test Bank
to accompany
Animal Physiology, 5th Edition
Hill • Wyse • Anderson

Chapter 1: Animals and Environments: Function on the Ecological Stage

TEST BANK QUESTIONS

Multiple Choice

1. Which statement about the discipline of physiology is *false*?
- It is a key discipline for understanding how animals change over Earth's history.
 - It is a key discipline for understanding the fundamental biology of all animals.
 - It is a key discipline for understanding human health and disease.
 - It is a key discipline for understanding the health and disease of nonhuman animals.

Answer: a

Textbook Reference: The Importance of Physiology

Bloom's Category: 5. Evaluating

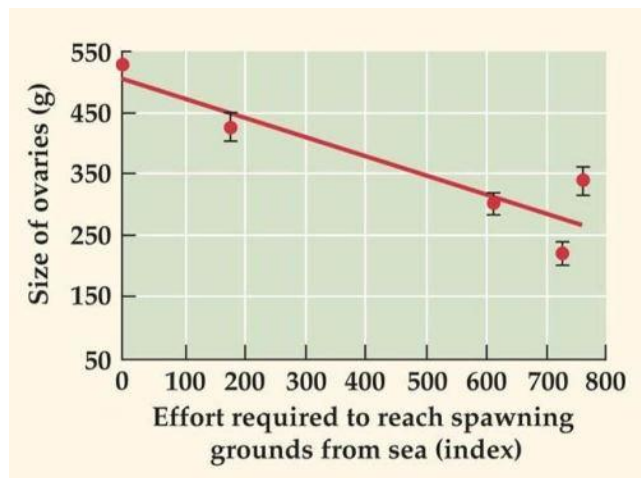
2. To understand how a fish propels itself by applying forces to the water, physiologists would study its
- biomechanics.
 - evolution.
 - ecology.
 - cell physiology.

Answer: a

Textbook Reference: The Highly Integrative Nature of Physiology

Bloom's Category: 2. Understanding

3. The data in the graph below would be relevant to which subdiscipline of physiology?



- a. Evolution
- b. Cell physiology
- c. Morphology
- d. Ecology

Answer: d

Textbook Reference: The Highly Integrative Nature of Physiology

Bloom's Category: 2. Understanding

4. In the study of physiology, the term “_____” refers to the components of living animals and the interactions among those components that enable animals to perform as they do.

- a. feedback
- b. regulation
- c. natural selection
- d. mechanism

Answer: d

Textbook Reference: Mechanism and Origin: Physiology's Two Central Questions

Bloom's Category: 1. Remembering

5. How is the light reaction in the firefly inhibited?

- a. Mitochondria prevent oxygen from reacting with luciferyl-AMP.
- b. Nitric oxide combines with oxygen to prevent reaction with luciferyl-AMP.
- c. ATP is prevented from combining with luciferin.
- d. Luciferase is prevented from catalyzing the reaction.

Answer: a

Textbook Reference: Mechanism and Origin: Physiology's Two Central Questions

Bloom's Category: 2. Understanding

6. Which of the following is *not* needed in the mechanism of light production in the firefly?

- a. Oxygen
- b. ATP
- c. Light
- d. Luciferin

Answer: c

Textbook Reference: Mechanism and Origin: Physiology's Two Central Questions

Bloom's Category: 2. Understanding

7. In the firefly, light is emitted when

- a. ATP combines with luciferin, forming luciferyl-AMP.
- b. released nitric oxide blocks the mitochondria's use of oxygen.
- c. the electron-excited product of O₂ and luciferyl-AMP returns to its ground state.
- d. luciferase is activated by oxygen.

Answer: c

Textbook Reference: Mechanism and Origin: Physiology's Two Central Questions

Bloom's Category: 5. Evaluating

8. Which of the following is considered the “on” switch for the light-emitting reaction of the firefly?

- a. Oxygen
- b. Luciferase
- c. Nitric oxide
- d. ATP

Answer: c

Textbook Reference: Mechanism and Origin: Physiology's Two Central Questions

Bloom's Category: 3. Applying

9. A physiological mechanism or other trait that is a product of evolution and is advantageous is called

- a. an adaptation.
- b. natural selection.
- c. adaptive significance.
- d. evolution.

Answer: a

Textbook Reference: Mechanism and Origin: Physiology's Two Central Questions

Bloom's Category: 1. Remembering

10. What is the adaptive significance of light emission in the firefly?

- a. Female fireflies emit light in such a way that distinguishes their species.
- b. All fireflies emit light to lure prey.
- c. Male fireflies emit light to attract mates.
- d. Male fireflies emit light to evade predators.

Answer: c

Textbook Reference: Mechanism and Origin: Physiology's Two Central Questions

Bloom's Category: 2. Understanding

11. Which of the following is a similarity between an octopus and a fish?

- a. The evolutionary adaptation of excellent vision
- b. The mechanism of vision
- c. The processing of visual signals before reaching the optic nerve
- d. The neuroanatomy of the eye

Answer: a

Textbook Reference: Mechanism and Origin: Physiology's Two Central Questions

Bloom's Category: 5. Evaluating

12. Research in the field of _____ physiology emphasizes synthesis across levels of biological organization.

- a. evolutionary
- b. comparative
- c. environmental
- d. integrative

Answer: d

Textbook Reference: This Book's Approach to Physiology

Bloom's Category: 2. Understanding

13. Which statement regarding animals is true?

- a. There is no distinction between an animal and its environment.
- b. Once adults, animals are structurally static.
- c. All animals require energy to maintain their organization.
- d. Body size is significant in the lives of only small animals.

Answer: c

Textbook Reference: Animals

Bloom's Category: 5. Evaluating

14. Most cells of an animal

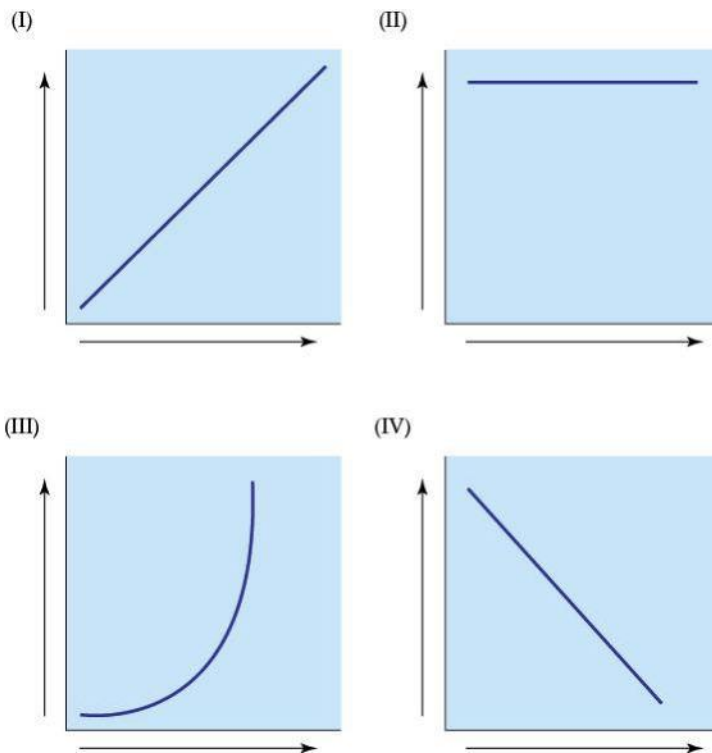
- a. are exposed to the external environment.
- b. are exposed to the internal environment.
- c. fluctuate between exposure to the external environment and the internal environment.
- d. turn over while being exposed to the internal environment.

Answer: b

Textbook Reference: Animals

Bloom's Category: 2. Understanding

15.–17. Refer to the figures below.



15. Which figure refers to a physiological trait that is regulated by an organism?

- a. I
- b. II
- c. III
- d. IV

Answer: b

Textbook Reference: Animals

Bloom's Category: 3. Applying

16. A migrating salmon regulates its internal Cl^- concentration, shown in figure _____, while conforming to water temperature, shown in figure _____.

- a. I; II
- b. II; I
- c. II; IV
- d. I; III

Answer: b

Textbook Reference: Animals

Bloom's Category: 4. Analyzing

17. Figure _____ shows an animal's regulation of its body temperature as the external temperature increases. Figure _____ shows no regulation of its body temperature as external temperature increases.

- a. I; II
- b. II; I
- c. II; IV
- d. II; III

Answer: b

Textbook Reference: Animals

Bloom's Category: 3. Applying

18. Which statement regarding physiological conformity and regulation is true?

- a. All animals will eventually conform.
- b. Animals are either regulators or conformers.
- c. An animal cannot be both an ion regulator and a temperature conformer.
- d. Conforming is more metabolically expensive than regulating.

Answer: a

Textbook Reference: Animals

Bloom's Category: 5. Evaluating

19. The functioning of regulatory mechanisms that automatically make adjustments to maintain internal constancy is called

- a. conformity.
- b. feedback.
- c. homeostasis.
- d. regulation.

Answer: c

Textbook Reference: Animals

Bloom's Category: 1. Remembering

20. During childbirth, muscular contractions acting to expel the fetus from the uterus induce hormonal signals that induce even more intense contractions. This is an example of

- a. homeostasis.
- b. negative feedback.
- c. a set point.
- d. positive feedback.

Answer: d

Textbook Reference: Animals

Bloom's Category: 2. Understanding

21. Physiological changes that occur by alteration of gene frequencies over the course of many generations are referred to as _____ changes.

- a. acute
- b. chronic
- c. evolutionary
- d. developmental

Answer: c

Textbook Reference: Animals

Bloom's Category: 2. Understanding

22. _____ is an example of "abandoning constancy" during thermoregulation.

- a. Sweating
- b. Shivering
- c. Hibernating
- d. Huddling

Answer: c

Textbook Reference: Animals

Bloom's Category: 3. Applying

23. What is the principal advantage of conformity?

- a. The process requires a large amount of energy.
- b. It allows cells to maintain a steady state.
- c. Very little energy is used by this process.
- d. Cells are subject to changes in their conditions.

Answer: c

Textbook Reference: Animals

Bloom's Category: 2. Understanding

24. Sweating in response to heat is an example of a(n)

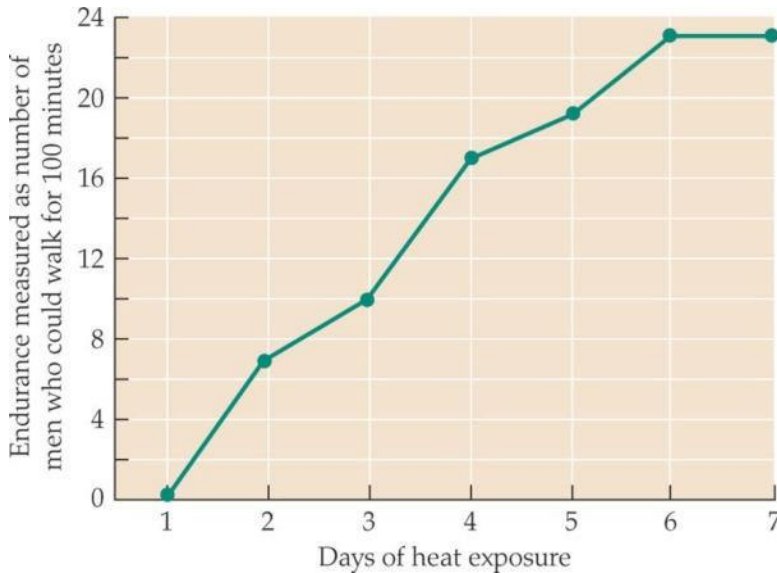
- a. acute change.
- b. chronic change.
- c. evolutionary change.
- d. developmental change.

Answer: a

Textbook Reference: Animals

Bloom's Category: 2. Understanding

25.–26. Refer to the figure below.



25. What type of physiological response does the figure refer to?

- a. Chronic response
- b. Acute response
- c. Evolutionary response
- d. Developmental response

Answer: a

Textbook Reference: Animals

Bloom's Category: 3. Applying

26. If the heat exposure were removed, the line in the diagram would

- a. continue to show a plateau.
- b. drop sharply.
- c. gradually drop to its initial starting point.
- d. drop but be maintained somewhere at the middle level.

Answer: c

Textbook Reference: Animals

Bloom's Category: 4. Analyzing

27. Which response is the longest lasting?

- a. Acute response
- b. Chronic response
- c. Evolutionary response
- d. Developmental response

Answer: c

Textbook Reference: Animals
Bloom's Category: 2. Understanding

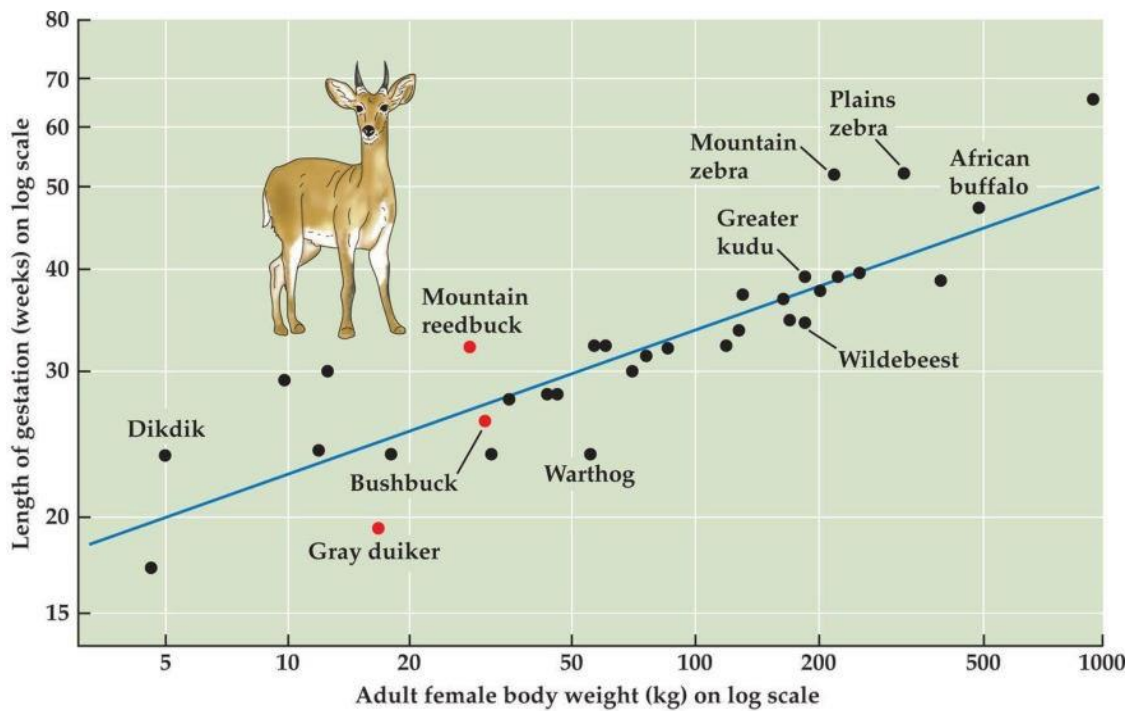
28. Rainbow trout captured and brought into a lab aquarium undergo a chronic adjustment to the conditions in the lab. This process is called

- a. phenotypic plasticity.
- b. feedback inhibition.
- c. acclimatization.
- d. acclimation.

Answer: d

Textbook Reference: Animals
Bloom's Category: 2. Understanding

29.–31. Refer to the figure below.



29. What statistical method was used to draw the trend line in the figure?

- a. Phylogenetically independent contrasts
- b. Ordinary least squares regression
- c. Weight-specific mean
- d. Logarithmic scaling

Answer: b

Textbook Reference: Animals
Bloom's Category: 3. Applying

30. According to the figure, what is the expected gestation period of a warthog?

- a. 20 weeks