

Vander's Human Physiology, 15e (Widmaier)

Chapter 1 Homeostasis: A Framework for Human Physiology

1) Which of these is NOT one of the four general categories of cells that make up the human body?

- A) Epithelial cells
- B) Collagen cells
- C) Connective tissue cells
- D) Neurons
- E) Muscle cells

Answer: B

Section: 01.02

Topic: Levels of organization

Bloom's: Level 1. Remember

HAPS Topic: Module A06 Levels of organization.

HAPS Outcome: A06.01 Describe, in order from simplest to most complex, the major levels of organization in the human organism.

2) Physiology is the study of

- A) how two organisms interact.
- B) how organisms function.
- C) the spread of diseases.
- D) the structure of the body.
- E) two of the choices are correct.

Answer: B

Section: 01.01

Topic: Scope of anatomy and physiology

Bloom's: Level 1. Remember

HAPS Topic: Module B01 Definition.

HAPS Outcome: A05.01 Define the terms anatomy and physiology.

3) The study of disease states in the body is called

- A) pathophysiology.
- B) anatomy.
- C) homeostasis.
- D) differentiation.
- E) histology.

Answer: A

Section: 01.01

Topic: Scope of anatomy and physiology

Bloom's: Level 1. Remember

HAPS Topic: Module A05 Basic terminology

HAPS Outcome: A05.01 Define the terms anatomy and physiology.

4) Which is NOT a connective tissue cell?

- A) Bone cell
- B) Skeletal muscle cell
- C) Blood cell
- D) Fat cell
- E) Cartilage cell

Answer: B

Section: 01.02

Topic: Levels of organization

Bloom's: Level 1. Remember

HAPS Topic: Module A06 Levels of organization.

HAPS Outcome: A06.02 Give an example of each level of organization.

5) What is the principal function performed by epithelial cells?

- A) Fat storage
- B) Anchoring body structures
- C) Forming boundaries between body compartments
- D) Generating movement
- E) Transmitting electrical signals

Answer: C

Section: 01.02

Topic: Levels of organization

Bloom's: Level 1. Remember

HAPS Topic: Module A06 Levels of organization.

HAPS Outcome: A06.02 Give an example of each level of organization.

6) The types of cells that are specialized to communicate with other cells and control their activities are

- A) epithelial cells.
- B) muscle cells.
- C) connective tissue cells.
- D) neurons.
- E) Two of the choices are correct.

Answer: D

Section: 01.02

Topic: Levels of organization

Bloom's: Level 1. Remember

HAPS Topic: Module A06 Levels of organization.

HAPS Outcome: A06.02 Give an example of each level of organization.

- 7) What is the term for the developmental process that leads to specialized cell types?
- A) Genomics
 - B) Differentiation
 - C) Homeostasis
 - D) Positive feedback
 - E) Acclimatization

Answer: B

Section: 01.02

Topic: Levels of organization

Bloom's: Level 1. Remember

HAPS Topic: Module A06 Levels of organization.

HAPS Outcome: A06.01 Describe, in order from simplest to most complex, the major levels of organization in the human organism.

- 8) Which best describes the extracellular matrix?
- A) It is found just inside the cell membrane in all tissues, it sends branching collagen fibers between cells to connect them, and it transmits chemical information from the interior of one cell to the interior of adjacent cells.
 - B) It is a tissue having more than the four general cell types, it transports proteins and polysaccharides between body compartments, and it is the route by which chemical signals like hormones reach all parts of the body.
 - C) It covers the body's surface, it contains connective and muscle tissue, and it helps generate movement.
 - D) It surrounds cells; it contains proteins, polysaccharides, and minerals; it provides a scaffold for cell attachment; and it transmits chemical messengers to cells.

Answer: D

Section: 01.02

Topic: Levels of organization

Bloom's: Level 2. Understand

HAPS Topic: Module A06 Levels of organization.

HAPS Outcome: A06.02 Give an example of each level of organization.

9) If a person begins to sweat upon entering a hot room but continued sweating is able to keep the body temperature stable, which of these best describes her condition?

- A) She is in an equilibrium state.
- B) She is not using energy to maintain a constant temperature.
- C) She is in a steady state.
- D) She is using a positive feedback mechanism.
- E) Two of the choices are correct.

Answer: C

Section: 01.05

Topic: Examples of homeostatic mechanisms

Bloom's: Level 2. Understand

HAPS Topic: Module B03 Examples of homeostatic mechanisms.; Module B04 Application of homeostatic mechanisms

HAPS Outcome: B03.01 Provide an example of a negative feedback loop that utilizes the nervous system to relay information. Describe the specific organs, structures, cells or molecules (receptors, neurons, CNS structures, effectors, neurotransmitters) included in the feedback loop.; B04.01 Provide specific examples to demonstrate how organ systems respond to maintain homeostasis.

10) Which concept is the defining feature of the discipline of physiology?

- A) Descent with modification
- B) Homeostasis
- C) Evolution
- D) Equilibrium
- E) Differentiation

Answer: B

Section: 01.04

Topic: Definition of homeostasis

Bloom's: Level 2. Understand

HAPS Topic: Module B01 Definition.

HAPS Outcome: B01.01 Define homeostasis.

- 11) Describing a physiological variable as "homeostatic" means that it
- A) has varied from the normal value, and will remain constant at the new value.
 - B) never varies from an exact set point value.
 - C) is in an equilibrium state that requires no energy input to stay at the normal value.
 - D) is in a state of dynamic constancy that is regulated to remain near a stable set point value.
 - E) has no normal range, but will just change to match the outside environmental conditions.

Answer: D

Section: 01.04

Topic: Definition of homeostasis

Bloom's: Level 2. Understand

HAPS Topic: Module B01 Definition.

HAPS Outcome: B01.01 Define homeostasis.

- 12) Which of the following situations best represents a homeostatic mechanism?
- A) A person who becomes very nervous begins to sweat profusely.
 - B) After going outside on a hot day, the core body temperature increases.
 - C) Increasing the size of fast-food restaurant portions causes body weight to increase.
 - D) After eating a large batch of salty popcorn, levels of salt in the urine increase.
 - E) As age increases, the amount of calcium in bones tends to decrease.

Answer: D

Section: 01.05

Topic: Examples of homeostatic mechanisms

Bloom's: Level 3. Apply

HAPS Topic: Module B03 Examples of homeostatic mechanisms.; Module B04 Application of homeostatic mechanisms

HAPS Outcome: B04.01 Provide specific examples to demonstrate how organ systems respond to maintain homeostasis.; B03.02 Provide an example of a negative feedback loop that utilizes the endocrine system to relay information. Describe the specific cells or molecules (production cells, hormones, target cells) included in the feedback loop.

13) What term is used to describe the steady-state value for any variable that the body attempts to maintain?

- A) Set point
- B) Equilibrium potential
- C) Error signal
- D) Reflex arc
- E) Median value

Answer: A

Section: 01.05

Topic: Examples of homeostatic mechanisms

Bloom's: Level 1. Remember

HAPS Topic: Module B02 General types of homeostatic mechanisms.

HAPS Outcome: B02.01 List the components of a feedback loop and explain the function of each.

14) Which of components of a general reflex arc are listed in the order information typically flows through them following a stimulus?

- A) Effector, afferent pathway, integrating center, efferent pathway, receptor
- B) Effector, efferent pathway, integrating center, afferent pathway, receptor
- C) Integrating center, receptor, afferent pathway, efferent pathway, effector
- D) Receptor, efferent pathway, integrating center, afferent pathway, effector
- E) Receptor, afferent pathway, integrating center, efferent pathway, effector

Answer: E

Section: 01.06

Topic: Examples of homeostatic mechanisms

Bloom's: Level 1. Remember

HAPS Topic: Module B02 General types of homeostatic mechanisms.

HAPS Outcome: B02.01 List the components of a feedback loop and explain the function of each.

15) Feedforward regulatory processes

- A) work in anticipation of changes in regulated variables.
- B) are identical to positive feedback processes.
- C) lead to instability of the regulated variable.
- D) maximize fluctuations in the regulated variable.
- E) tend to force physiological variables away from their set point.

Answer: A

Section: 01.05

Topic: Examples of homeostatic mechanisms

Bloom's: Level 2. Understand

HAPS Topic: Module B04 Application of homeostatic mechanisms

HAPS Outcome: B04.01 Provide specific examples to demonstrate how organ systems respond to maintain homeostasis.

- 16) Which situation describes a feedforward mechanism?
- A) Blood glucose returns toward normal an hour after a meal.
 - B) The smell of rotten food on a plate triggers the vomit reflex.
 - C) A drop in core body temperature triggers shivering.
 - D) An increase in core body temperature stimulates sweating.
 - E) Food in the stomach triggers the production of stomach acid.

Answer: B

Section: 01.05

Topic: Examples of homeostatic mechanisms

Bloom's: Level 3. Apply

HAPS Topic: Module B04 Application of homeostatic mechanisms

HAPS Outcome: B04.01 Provide specific examples to demonstrate how organ systems respond to maintain homeostasis.

- 17) What is the general purpose of positive feedback mechanisms?
- A) To maintain a constant internal environment
 - B) To anticipate changes in the environment
 - C) To return a variable toward the set point
 - D) To bring about a rapid change in the body
 - E) To detect changes in the external environment

Answer: D

Section: 01.05

Topic: Examples of homeostatic mechanisms

Bloom's: Level 2. Understand

HAPS Topic: Module B02 General types of homeostatic mechanisms.

HAPS Outcome: B02.02 Compare and contrast positive and negative feedback in terms of the relationship between stimulus and response.

- 18) Shivering in response to a cold draft is an example of
- A) a homeostatic mechanism.
 - B) positive feedback.
 - C) feedforward regulation.
 - D) acclimation.
 - E) Two of the choices are correct.

Answer: E

Section: 01.05

Topic: Examples of homeostatic mechanisms

Bloom's: Level 2. Understand

HAPS Topic: Module B03 Examples of homeostatic mechanisms.; Module B04 Application of homeostatic mechanisms

HAPS Outcome: B03.01 Provide an example of a negative feedback loop that utilizes the nervous system to relay information. Describe the specific organs, structures, cells or molecules (receptors, neurons, CNS structures, effectors, neurotransmitters) included in the feedback loop.; B04.01 Provide specific examples to demonstrate how organ systems respond to maintain homeostasis.

- 19) If the amount of sodium in the blood decreases, what would a negative feedback control mechanism be expected to do?
- A) Decrease the amount of sodium in the blood
 - B) Increase the amount of sodium in the blood
 - C) Leave the amount of sodium unchanged
 - D) Change the set point for sodium
 - E) Inhibit the ingestion of more sodium

Answer: B

Section: 01.05

Topic: Examples of homeostatic mechanisms

Bloom's: Level 3. Apply

HAPS Topic: Module B03 Examples of homeostatic mechanisms.; Module B04 Application of homeostatic mechanisms

HAPS Outcome: B03.01 Provide an example of a negative feedback loop that utilizes the nervous system to relay information. Describe the specific organs, structures, cells or molecules (receptors, neurons, CNS structures, effectors, neurotransmitters) included in the feedback loop.; B04.01 Provide specific examples to demonstrate how organ systems respond to maintain homeostasis.

- 20) What is the best description of the efferent pathway of a reflex arc?
- A) Signals from the integrating center to receptors
 - B) The route by which receptors send signals to effectors
 - C) Signaling pathway for receptors to influence the integrating center
 - D) The route by which effector organs send signals to receptors
 - E) The route by which signals from an integrating center reach effector organs

Answer: E

Section: 01.06

Topic: Examples of homeostatic mechanisms

Bloom's: Level 2. Understand

HAPS Topic: Module B02 General types of homeostatic mechanisms.; Module B03 Examples of homeostatic mechanisms.

HAPS Outcome: B02.01 List the components of a feedback loop and explain the function of each.; B03.01 Provide an example of a negative feedback loop that utilizes the nervous system to relay information. Describe the specific organs, structures, cells or molecules (receptors, neurons, CNS structures, effectors, neurotransmitters) included in the feedback loop.

- 21) Which one of the following is the correct sequence for a regulatory reflex arc?
- A) Stimulus, effector, efferent pathway, integrating center, afferent pathway, receptor
 - B) Stimulus, receptor, efferent pathway, integrating center, afferent pathway, effector
 - C) Stimulus, receptor, afferent pathway, integrating center, efferent pathway, effector
 - D) Stimulus, effector, afferent pathway, integrating center, efferent pathway, receptor
 - E) Effector, efferent pathway, integrating center, afferent pathway, receptor, stimulus

Answer: C

Section: 01.06

Topic: Examples of homeostatic mechanisms

Bloom's: Level 1. Remember

HAPS Topic: Module B02 General types of homeostatic mechanisms.; Module B03 Examples of homeostatic mechanisms.

HAPS Outcome: B02.01 List the components of a feedback loop and explain the function of each.; B03.01 Provide an example of a negative feedback loop that utilizes the nervous system to relay information. Describe the specific organs, structures, cells or molecules (receptors, neurons, CNS structures, effectors, neurotransmitters) included in the feedback loop.

22) Identify the effectors in this homeostatic reflex: Eating a salt-rich meal increases blood volume and pressure, stretching blood vessel walls. Nerve signals sent to the brainstem stimulate changes in hormonal and neural signaling. The heart rate is slowed, blood vessel walls are relaxed, and the kidneys increase urinary salt. The blood pressure returns toward normal.

- A) Brainstem and blood vessels
- B) Blood vessels, hormones, and nerves
- C) Heart, blood vessels, and kidneys
- D) Brainstem, blood vessels, and kidneys
- E) Hormones and nerves

Answer: C

Section: 01.06

Topic: Examples of homeostatic mechanisms

Bloom's: Level 3. Apply

HAPS Topic: Module B02 General types of homeostatic mechanisms.; Module B03 Examples of homeostatic mechanisms.; Module B05 Predictions related to homeostatic imbalance, including disease states and disorders.;

Module B04 Application of homeostatic mechanisms
HAPS Outcome: B02.01 List the components of a feedback loop and explain the function of each.; B03.01 Provide an example of a negative feedback loop that utilizes the nervous system to relay information. Describe the specific organs, structures, cells or molecules (receptors, neurons, CNS structures, effectors, neurotransmitters) included in the feedback loop.; B04.01 Provide specific examples to demonstrate how organ systems respond to maintain homeostasis.; B05.01 Predict factors or situations affecting various organ systems that could disrupt homeostasis.

23) The hormone insulin enhances the transport of glucose into body cells. Its secretion is controlled by a negative feedback system between the concentration of glucose in the blood and the cells that secrete insulin. Which of the following statements is most likely to be correct?

A) A decrease in blood glucose concentration will stimulate insulin secretion, which will in turn lower the blood glucose concentration still further.

B) An increase in blood glucose concentration will stimulate insulin secretion, which will in turn lower the blood glucose concentration.

C) A decrease in blood glucose concentration will stimulate insulin secretion, which will in turn increase the blood glucose concentration.

D) An increase in blood glucose concentration will stimulate insulin secretion, which will in turn increase the blood glucose concentration still further.

Answer: B

Section: 01.05

Topic: Examples of homeostatic mechanisms

Bloom's: Level 3. Apply

HAPS Topic: Module B03 Examples of homeostatic mechanisms.; Module B04 Application of homeostatic mechanisms

HAPS Outcome: B04.01 Provide specific examples to demonstrate how organ systems respond to maintain homeostasis.; B03.02 Provide an example of a negative feedback loop that utilizes the endocrine system to relay information. Describe the specific cells or molecules (production cells, hormones, target cells) included in the feedback loop.

24) How are endocrine glands and hormones involved in homeostatic reflexes?

A) Endocrine glands can be receptors, and hormones can be effectors.

B) Endocrine glands can be integrating centers, and hormones can be efferent pathways.

C) Endocrine glands can be efferent pathways, and hormones can be effectors.

D) Endocrine glands are not part of reflex mechanisms, but hormones can be afferent or efferent pathways.

E) They are not involved; reflexes only involve actions of the nervous system.

Answer: B

Section: 01.06; 01.07

Topic: Examples of homeostatic mechanisms

Bloom's: Level 2. Understand

HAPS Topic: Module B03 Examples of homeostatic mechanisms.

HAPS Outcome: B03.02 Provide an example of a negative feedback loop that utilizes the endocrine system to relay information. Describe the specific cells or molecules (production cells, hormones, target cells) included in the feedback loop.

25) What is a hormone?

- A) A chemical released from a nerve cell that affects nearby cells across a synapse
- B) A chemical released from an endocrine gland that affects target cells without entering the bloodstream
- C) A chemical found in the blood that catalyzes the destruction of ingested toxins and foreign substances
- D) A chemical found in the sweat that signals other individuals about the physiological status of the body
- E) A chemical regulator secreted from an endocrine gland that travels through the bloodstream to affect target cells

Answer: E

Section: 01.07

Topic: Examples of homeostatic mechanisms

Bloom's: Level 2. Understand

HAPS Topic: Module J01 General functions of the endocrine system.

HAPS Outcome: J01.02 Define the terms hormone, endocrine gland, endocrine tissue (organ), and target cell.

26) Some neurons in the vagus nerve have synaptic connections to sinoatrial cells (pacemaker) in the heart. These neurons secrete acetylcholine, which ultimately results in a decreased heart rate.

This is an example of

- A) endocrine control.
- B) exocrine control.
- C) hormonal control.
- D) neural control.
- E) paracrine control.

Answer: D

Section: 01.07

Topic: Examples of homeostatic mechanisms

Bloom's: Level 2. Understand

HAPS Topic: Module B03 Examples of homeostatic mechanisms.

HAPS Outcome: B03.01 Provide an example of a negative feedback loop that utilizes the nervous system to relay information. Describe the specific organs, structures, cells or molecules (receptors, neurons, CNS structures, effectors, neurotransmitters) included in the feedback loop.

27) Heart rate is increased by the release of epinephrine by the adrenal medulla into the bloodstream. This is an example of

- A) endocrine control.
- B) exocrine control.
- C) paracrine control.
- D) direct neural control.
- E) positive feedback.

Answer: A

Section: 01.07

Topic: Examples of homeostatic mechanisms

Bloom's: Level 2. Understand

HAPS Topic: Module B03 Examples of homeostatic mechanisms.

HAPS Outcome: B03.02 Provide an example of a negative feedback loop that utilizes the endocrine system to relay information. Describe the specific cells or molecules (production cells, hormones, target cells) included in the feedback loop.

28) How is autocrine regulation best described?

- A) Chemical regulators are released directly into blood vessels.
- B) Chemical regulators released by cells affect the functional status of different kinds of cells in the vicinity of the secretory cell.
- C) Chemical regulators affect the same cells that produce them.
- D) Chemical regulators reach their site of action through a duct.
- E) Chemical regulators are continuously released in constant amounts by the cell.

Answer: C

Section: 01.07

Topic: Examples of homeostatic mechanisms

Bloom's: Level 2. Understand

HAPS Topic: Module J06 Local hormones (paracrines and autocrines) and growth factors.

HAPS Outcome: J06.01 Define the terms paracrine and autocrine.

- 29) The tall slender body shape that helps to dissipate heat in people native to equatorial regions is an example of
- A) an adaptation.
 - B) acclimatization.
 - C) set point resetting.
 - D) homeostasis.
 - E) phase shift.

Answer: A

Section: 01.08

Topic: Human origins and adaptations

Bloom's: Level 3. Apply

HAPS Topic: Module B03 Examples of homeostatic mechanisms.

HAPS Outcome: B03.01 Provide an example of a negative feedback loop that utilizes the nervous system to relay information. Describe the specific organs, structures, cells or molecules (receptors, neurons, CNS structures, effectors, neurotransmitters) included in the feedback loop.

- 30) After spending several days at a high altitude, where oxygen pressure is low, a person will begin to produce more red blood cells, which enhances the ability of blood to carry oxygen to the tissues. What term best describes this type of response?
- A) Developmental acclimatization
 - B) Positive feedback
 - C) Physiological acclimatization
 - D) Feedforward regulation
 - E) Evolution

Answer: C

Section: 01.08

Topic: Types of homeostatic mechanisms

Bloom's: Level 3. Apply

HAPS Topic: Module B03 Examples of homeostatic mechanisms.; Module B04 Application of homeostatic mechanisms

HAPS Outcome: B03.01 Provide an example of a negative feedback loop that utilizes the nervous system to relay information. Describe the specific organs, structures, cells or molecules (receptors, neurons, CNS structures, effectors, neurotransmitters) included in the feedback loop.; B04.01 Provide specific examples to demonstrate how organ systems respond to maintain homeostasis.

- 31) Circadian rhythms are biological rhythms with what main characteristic?
- A) They are cyclical, like the 28-day female menstrual cycle.
 - B) They are cyclical, like the rhythmic beating of the heart.
 - C) They are voluntary rhythms, like the time you decide to eat lunch each day.
 - D) They cease to occur when a person is in a dark environment.
 - E) They repeat approximately every 24 hours, like daily spikes in hormone secretion.

Answer: E

Section: 01.08

Topic: Types of homeostatic mechanisms

Bloom's: Level 1. Remember

HAPS Topic: Module B03 Examples of homeostatic mechanisms.; Module B04 Application of homeostatic mechanisms

HAPS Outcome: B03.01 Provide an example of a negative feedback loop that utilizes the nervous system to relay information. Describe the specific organs, structures, cells or molecules (receptors, neurons, CNS structures, effectors, neurotransmitters) included in the feedback loop.; B04.01 Provide specific examples to demonstrate how organ systems respond to maintain homeostasis.; B03.02 Provide an example of a negative feedback loop that utilizes the endocrine system to relay information. Describe the specific cells or molecules (production cells, hormones, target cells) included in the feedback loop.

- 32) What is the location of the internal pacemaker that sets biological rhythms?
- A) Suprachiasmatic nucleus of the brain
 - B) Ventricles of the heart
 - C) Endocrine gland in the gonads
 - D) Photoreceptors of the eye
 - E) The adrenal glands

Answer: A

Section: 01.08

Topic: Types of homeostatic mechanisms

Bloom's: Level 1. Remember

HAPS Topic: Module B03 Examples of homeostatic mechanisms.; Module B04 Application of homeostatic mechanisms

HAPS Outcome: B03.01 Provide an example of a negative feedback loop that utilizes the nervous system to relay information. Describe the specific organs, structures, cells or molecules (receptors, neurons, CNS structures, effectors, neurotransmitters) included in the feedback loop.; B04.01 Provide specific examples to demonstrate how organ systems respond to maintain homeostasis.; B03.02 Provide an example of a negative feedback loop that utilizes the endocrine system to relay information. Describe the specific cells or molecules (production cells, hormones, target cells) included in the feedback loop.

33) A protein is found in blood that is produced by the pancreas and acts on receptors of cells in the liver. What type of physiological regulator is it most likely to be?

- A) A hormone
- B) An autocrine signal
- C) A paracrine signal
- D) A neurotransmitter
- E) An enzyme

Answer: A

Section: 01.07

Topic: Types of homeostatic mechanisms

Bloom's: Level 3. Apply

HAPS Topic: Module J01 General functions of the endocrine system.

HAPS Outcome: J01.02 Define the terms hormone, endocrine gland, endocrine tissue (organ), and target cell.

34) Which best describes how the total body balance of any chemical substance is determined?

- A) The rate the body produces the substance
- B) The rate the substance is secreted from the body
- C) The rate the substance is metabolized by the body
- D) The difference between the amount of substance lost from the body and the amount gained the body
- E) The amount produced by the body minus the amount metabolized by the body

Answer: D

Section: 01.08

Topic: Types of homeostatic mechanisms

Bloom's: Level 2. Understand

HAPS Topic: Module B05 Predictions related to homeostatic imbalance, including disease states and disorders.

HAPS Outcome: B05.01 Predict factors or situations affecting various organ systems that could disrupt homeostasis.

35) A burn patient ingests 100 grams of protein per day and loses 110 grams of protein per day due to the injury. What is the overall protein state of the patient?

- A) Positive protein balance
- B) Negative protein balance
- C) Stable protein balance
- D) A state that can't be determined

Answer: B

Section: 01.08

Topic: Types of homeostatic mechanisms

Bloom's: Level 3. Apply

HAPS Topic: Module B05 Predictions related to homeostatic imbalance, including disease states and disorders.; Module 06 Application of homeostatic mechanisms; Module 07 Predictions related to homeostatic imbalance, including disease states & disorders

HAPS Outcome: O07.01 Predict factors or situations affecting metabolism that could disrupt homeostasis.; B05.01 Predict factors or situations affecting various organ systems that could disrupt homeostasis.

36) Eating a bag of salty potato chips without increasing sodium excretion would result in what state?

- A) Positive sodium balance
- B) Negative sodium balance
- C) Stable sodium balance
- D) It can't be determined without knowing the size of the sodium pool

Answer: A

Section: 01.08

Topic: Types of homeostatic mechanisms

Bloom's: Level 3. Apply

HAPS Topic: Module B05 Predictions related to homeostatic imbalance, including disease states and disorders.; Module O07 Predictions related to homeostatic imbalance, including disease states & disorders

HAPS Outcome: O07.01 Predict factors or situations affecting metabolism that could disrupt homeostasis.; B05.01 Predict factors or situations affecting various organ systems that could disrupt homeostasis.

37) An experimental subject is isolated in an underground room with no windows, no clocks, and no contact with the outside world. Researchers monitoring his behavior observe that he eats breakfast a little bit later each day. What term best describes the subject's biological activity?

- A) Circadian rhythm
- B) Free-running rhythm
- C) Jet lag
- D) Phase shift
- E) Entrainment

Answer: B

Section: 01.08

Topic: Types of homeostatic mechanisms

Bloom's: Level 2. Understand

HAPS Topic: Module B03 Examples of homeostatic mechanisms.; Module B04 Application of homeostatic mechanisms

HAPS Outcome: B03.01 Provide an example of a negative feedback loop that utilizes the nervous system to relay information. Describe the specific organs, structures, cells or molecules (receptors, neurons, CNS structures, effectors, neurotransmitters) included in the feedback loop.; B04.01 Provide specific examples to demonstrate how organ systems respond to maintain homeostasis.; B03.02 Provide an example of a negative feedback loop that utilizes the endocrine system to relay information. Describe the specific cells or molecules (production cells, hormones, target cells) included in the feedback loop.

38) Which equation is most accurate?

- A) Extracellular fluid volume + interstitial fluid volume = whole body fluid volume
- B) Intracellular fluid volume + interstitial fluid volume = extracellular fluid volume
- C) Extracellular fluid volume - interstitial fluid volume = plasma volume
- D) Plasma volume + intracellular fluid volume = extracellular fluid volume
- E) Total body fluid volume - intracellular fluid volume = interstitial fluid volume

Answer: C

Section: 01.03

Topic: Examples of homeostatic mechanisms

Bloom's: Level 1. Remember

HAPS Topic: Module Q02 Description of the major fluid compartments.

HAPS Outcome: Q02.01 Describe the fluid compartments (including the subdivisions of the extracellular fluid) and state the relative volumes of each.

- 39) The internal environment of the body refers to
- A) the plasma.
 - B) the interstitial fluid.
 - C) the intracellular fluid.
 - D) the interstitial fluid and the intracellular fluid combined.
 - E) the plasma, the interstitial fluid, and the intracellular fluid combined.

Answer: E

Section: 01.03

Topic: Survey of body systems

Bloom's: Level 1. Remember

HAPS Topic: Module Q02 Description of the major fluid compartments.

HAPS Outcome: Q02.01 Describe the fluid compartments (including the subdivisions of the extracellular fluid) and state the relative volumes of each.

- 40) The interstitial fluid refers to
- A) the fluid within the cells.
 - B) the plasma.
 - C) the fluid between the cells.
 - D) the plasma and fluid between the cells.
 - E) the fluid between the cells and the fluid within the cells.

Answer: C

Section: 01.03

Topic: Survey of body systems

Bloom's: Level 1. Remember

HAPS Topic: Module Q02 Description of the major fluid compartments.

HAPS Outcome: Q02.01 Describe the fluid compartments (including the subdivisions of the extracellular fluid) and state the relative volumes of each.

- 41) Neglecting protein differences, which of the following fluids has a virtually identical solute concentration?
- A) The interstitial fluid and the intracellular fluid
 - B) The interstitial fluid and the plasma
 - C) The extracellular fluid and the plasma
 - D) The interstitial fluid, the extracellular fluid, and the plasma
 - E) None of these choices

Answer: C

Section: 01.03

Topic: Survey of body systems

Bloom's: Level 1. Remember

HAPS Topic: Module Q02 Description of the major fluid compartments.

HAPS Outcome: Q02.01 Describe the fluid compartments (including the subdivisions of the extracellular fluid) and state the relative volumes of each.

42) When a blood vessel is injured, it releases chemicals that activate platelets and cause them to stick to the injury site. The activated platelets in turn release more chemicals and attract more platelets to the injury site until the wound is fully sealed. This process of blood clotting is an example of

- A) negative feedback.
- B) positive feedback.
- C) feedforward regulation.
- D) adaptation.
- E) acclimatization.

Answer: B

Section: 01.05

Topic: Types of homeostatic mechanisms

Bloom's: Level 2. Understand

HAPS Topic: Module B03 Examples of homeostatic mechanisms.; Module B04 Application of homeostatic mechanisms

HAPS Outcome: B03.03 Provide an example of a positive feedback loop in the body. Describe the specific structures (organs, cells or molecules) included in the feedback loop.; B04.01 Provide specific examples to demonstrate how organ systems respond to maintain homeostasis.

43) During childbirth, as a baby's head is pressed against the mother's cervix, signals are relayed via nerves from cervix to the mother's brain. The brain initiates the secretion of oxytocin (a hormone) from the mother's pituitary gland. Oxytocin stimulates further uterine contractions. As the uterus contracts even harder in response to oxytocin, the baby's head is pushed harder against the cervix; this stimulates yet more nerve signals to the mother's brain, resulting in yet more oxytocin secretion until finally the baby is pushed through the cervix. This process of childbirth is an example of

- A) negative feedback.
- B) positive feedback.
- C) feedforward regulation.
- D) adaptation.
- E) acclimatization.

Answer: B

Section: 01.05

Topic: Types of homeostatic mechanisms

Bloom's: Level 3. Apply

HAPS Topic: Module B03 Examples of homeostatic mechanisms.; Module B04 Application of homeostatic mechanisms

HAPS Outcome: B03.01 Provide an example of a negative feedback loop that utilizes the nervous system to relay information. Describe the specific organs, structures, cells or molecules (receptors, neurons, CNS structures, effectors, neurotransmitters) included in the feedback loop.; B04.01 Provide specific examples to demonstrate how organ systems respond to maintain homeostasis.; B03.02 Provide an example of a negative feedback loop that utilizes the endocrine system to relay information. Describe the specific cells or molecules (production cells, hormones, target cells) included in the feedback loop.

44) During childbirth, as a baby's head is pressed against the mother's cervix, signals are relayed via nerves from cervix to the mother's brain. The brain initiates the secretion of oxytocin (a hormone) from the mother's pituitary gland. Oxytocin stimulates further uterine contractions. As the uterus contracts even harder in response to oxytocin, the baby's head is pushed harder against the cervix; this stimulates yet more nerve signals to the mother's brain, resulting in yet more oxytocin secretion until finally the baby is pushed through the cervix. The integrating center in this process of childbirth is

- A) the mother's brain.
- B) the mother's cervix.
- C) the nerve signals to the mother's brain.
- D) oxytocin.
- E) the mother's pituitary gland.

Answer: A

Section: 01.05

Topic: Types of homeostatic mechanisms

Bloom's: Level 3. Apply

HAPS Topic: Module B03 Examples of homeostatic mechanisms.; Module B04 Application of homeostatic mechanisms

HAPS Outcome: B03.01 Provide an example of a negative feedback loop that utilizes the nervous system to relay information. Describe the specific organs, structures, cells or molecules (receptors, neurons, CNS structures, effectors, neurotransmitters) included in the feedback loop.; B04.01 Provide specific examples to demonstrate how organ systems respond to maintain homeostasis.; B03.02 Provide an example of a negative feedback loop that utilizes the endocrine system to relay information. Describe the specific cells or molecules (production cells, hormones, target cells) included in the feedback loop.

45) During childbirth, as a baby's head is pressed against the mother's cervix, signals are relayed via nerves from cervix to the mother's brain. The brain initiates the secretion of oxytocin (a hormone) from the mother's pituitary gland. Oxytocin stimulates further uterine contractions. As the uterus contracts even harder in response to oxytocin, the baby's head is pushed harder against the cervix; this stimulates yet more nerve signals to the mother's brain, resulting in yet more oxytocin secretion until finally the baby is pushed through the cervix. The effector in this process of childbirth is

- A) the mother's brain.
- B) the mother's cervix.
- C) the nerve signals to the mother's brain.
- D) oxytocin.
- E) the mother's pituitary gland.

Answer: E

Section: 01.05

Topic: Types of homeostatic mechanisms

Bloom's: Level 3. Apply

HAPS Topic: Module B03 Examples of homeostatic mechanisms.; Module B04 Application of homeostatic mechanisms

HAPS Outcome: B03.01 Provide an example of a negative feedback loop that utilizes the nervous system to relay information. Describe the specific organs, structures, cells or molecules (receptors, neurons, CNS structures, effectors, neurotransmitters) included in the feedback loop.; B04.01 Provide specific examples to demonstrate how organ systems respond to maintain homeostasis.; B03.02 Provide an example of a negative feedback loop that utilizes the endocrine system to relay information. Describe the specific cells or molecules (production cells, hormones, target cells) included in the feedback loop.

- 46) During breastfeeding, as the baby suckles, nerve signals are relayed from the mother's nipple to the mother's brain. The brain initiates the mother's pituitary gland to produce more prolactin (a hormone), which causes more milk to be ejected. This process of breastfeeding is an example of
- A) negative feedback.
 - B) positive feedback.
 - C) feedforward regulation.
 - D) adaptation.
 - E) acclimatization.

Answer: B

Section: 01.05

Topic: Types of homeostatic mechanisms

Bloom's: Level 3. Apply

HAPS Topic: Module B03 Examples of homeostatic mechanisms.; Module B04 Application of homeostatic mechanisms

HAPS Outcome: B03.01 Provide an example of a negative feedback loop that utilizes the nervous system to relay information. Describe the specific organs, structures, cells or molecules (receptors, neurons, CNS structures, effectors, neurotransmitters) included in the feedback loop.; B04.01 Provide specific examples to demonstrate how organ systems respond to maintain homeostasis.; B03.02 Provide an example of a negative feedback loop that utilizes the endocrine system to relay information. Describe the specific cells or molecules (production cells, hormones, target cells) included in the feedback loop.

- 47) Some adults have the ability to digest lactose in milk. This is an example of
- A) negative feedback.
 - B) positive feedback.
 - C) feedforward regulation.
 - D) adaptation.
 - E) None of the choices are correct.

Answer: D

Section: 01.08

Topic: Examples of homeostatic mechanisms

Bloom's: Level 3. Apply

HAPS Topic: Module B03 Examples of homeostatic mechanisms.; Module B04 Application of homeostatic mechanisms

HAPS Outcome: B03.01 Provide an example of a negative feedback loop that utilizes the nervous system to relay information. Describe the specific organs, structures, cells or molecules (receptors, neurons, CNS structures, effectors, neurotransmitters) included in the feedback loop.; B04.01 Provide specific examples to demonstrate how organ systems respond to maintain homeostasis.; B03.02 Provide an example of a negative feedback loop that utilizes the endocrine system to relay information. Describe the specific cells or molecules (production cells, hormones, target cells) included in the feedback loop.

- 48) As soon as a person sees a cup of lemon juice, they start to salivate. This is an example of
- A) negative feedback.
 - B) positive feedback.
 - C) feedforward regulation.
 - D) adaptation.
 - E) None of the choices are correct.

Answer: C

Section: 01.05

Topic: Types of homeostatic mechanisms

Bloom's: Level 3. Apply

HAPS Topic: Module B04 Application of homeostatic mechanisms

HAPS Outcome: B04.01 Provide specific examples to demonstrate how organ systems respond to maintain homeostasis.

- 49) Differentiation is necessary before a cell can exchange material with its environment.

Answer: FALSE

Section: 01.02

Topic: Levels of organization

Bloom's: Level 2. Understand

HAPS Topic: Module A06 Levels of organization.

HAPS Outcome: A06.01 Describe, in order from simplest to most complex, the major levels of organization in the human organism.

- 50) The number of distinct cell types in the human body is about twenty.

Answer: FALSE

Section: 01.02

Topic: Levels of organization

Bloom's: Level 1. Remember

HAPS Topic: Module A06 Levels of organization.

HAPS Outcome: A06.01 Describe, in order from simplest to most complex, the major levels of organization in the human organism.

- 51) One function of epithelial cells is to form selective barriers regulating exchange of materials across them.

Answer: TRUE

Section: 01.02

Topic: Levels of organization

Bloom's: Level 1. Remember

HAPS Topic: Module A06 Levels of organization.

HAPS Outcome: A06.02 Give an example of each level of organization.

52) Organs are generally composed of only one kind of tissue.

Answer: FALSE

Section: 01.02

Topic: Levels of organization

Bloom's: Level 1. Remember

HAPS Topic: Module A06 Levels of organization.

HAPS Outcome: A06.01 Describe, in order from simplest to most complex, the major levels of organization in the human organism.

53) The respiratory system is primarily responsible for transporting blood to the body's tissues.

Answer: FALSE

Section: 01.02

Topic: Survey of body systems

Bloom's: Level 1. Remember

HAPS Topic: Module A07 Survey of body systems.

HAPS Outcome: A07.02 Describe the major functions of each organ system.

54) Homeostasis refers to the relative constancy of the external environment.

Answer: FALSE

Section: 01.04

Topic: Definition of homeostasis

Bloom's: Level 1. Remember

HAPS Topic: Module B01 Definition.

HAPS Outcome: B01.01 Define homeostasis.

55) The composition of the fluid bathing the cells of the body is the same as that within the cells.

Answer: FALSE

Section: 01.03

Topic: Survey of body systems

Bloom's: Level 2. Understand

HAPS Topic: Module Q03 Chemical composition of the major compartment fluids.

HAPS Outcome: Q03.02 Compare and contrast the relative concentrations of major electrolytes in intracellular and extracellular fluids.

56) The extracellular fluid compartment includes the interstitial fluid and plasma.

Answer: TRUE

Section: 01.03

Topic: Survey of body systems

Bloom's: Level 1. Remember

HAPS Topic: Module Q02 Description of the major fluid compartments.

HAPS Outcome: Q02.01 Describe the fluid compartments (including the subdivisions of the extracellular fluid) and state the relative volumes of each.

57) Homeostatic control systems and acclimatization are examples of biological adaptations.

Answer: TRUE

Section: 01.08

Topic: Examples of homeostatic mechanisms

Bloom's: Level 2. Understand

HAPS Topic: Module B04 Application of homeostatic mechanisms

HAPS Outcome: B04.01 Provide specific examples to demonstrate how organ systems respond to maintain homeostasis.

58) A person who is acclimated to a hot environment will begin to react physiologically to a decreased environmental temperature faster than a person who is not.

Answer: FALSE

Section: 01.08

Topic: Examples of homeostatic mechanisms

Bloom's: Level 2. Understand

HAPS Topic: Module B03 Examples of homeostatic mechanisms.

HAPS Outcome: B04.01 Provide specific examples to demonstrate how organ systems respond to maintain homeostasis.

59) When loss of a substance from the body exceeds gain, the body is said to be in positive balance for that substance.

Answer: FALSE

Section: 01.08

Topic: Examples of homeostatic mechanisms

Bloom's: Level 1. Remember

HAPS Topic: Module B05 Predictions related to homeostatic imbalance, including disease states and disorders.; Module O07 Predictions related to homeostatic imbalance, including disease states & disorders

HAPS Outcome: O07.01 Predict factors or situations affecting metabolism that could disrupt homeostasis.; B05.01 Predict factors or situations affecting various organ systems that could disrupt homeostasis.

60) The negative feedback system is much more common than the positive feedback system.

Answer: TRUE

Section: 01.05

Topic: Types of homeostatic mechanisms

Bloom's: Level 1. Remember

HAPS Topic: Module B02 General types of homeostatic mechanisms.

HAPS Outcome: B02.02 Compare and contrast positive and negative feedback in terms of the relationship between stimulus and response.

61) _____ is the general term for a chemical released by the endings of neurons onto other neurons, muscle cells, or gland cells.

Answer: Neurotransmitter

Section: 01.07

Topic: Survey of body systems

Bloom's: Level 1. Remember

HAPS Topic: Module A07 Survey of body systems.; Module J01 General functions of the endocrine system.

HAPS Outcome: J01.03 Compare and contrast how the nervous and endocrine systems control body function, with emphasis on the mechanisms by which the controlling signals are transferred through the body and the time course of the response(s) and action(s).; A07.02 Describe the major functions of each organ system.

62) _____ is the general term for a chemical released by the endings of neurons into the bloodstream.

Answer: Neurohormone

Section: 01.07

Topic: Survey of body systems

Bloom's: Level 1. Remember

HAPS Topic: Module A07 Survey of body systems.

HAPS Outcome: J01.03 Compare and contrast how the nervous and endocrine systems control body function, with emphasis on the mechanisms by which the controlling signals are transferred through the body and the time course of the response(s) and action(s).

63) _____ regulation describes regulation of cellular activity by messengers from nearby cells.

Answer: Paracrine

Section: 01.07

Topic: Examples of homeostatic mechanisms

Bloom's: Level 1. Remember

HAPS Topic: Module J06 Local hormones (paracrines and autocrines) and growth factors.

HAPS Outcome: J06.01 Define the terms paracrine and autocrine.

64) _____ is the term describing regulation of cellular activity by chemical mediators produced by that same cell.

Answer: Autocrine

Section: 01.07

Topic: Examples of homeostatic mechanisms

Bloom's: Level 1. Remember

HAPS Topic: Module J06 Local hormones (paracrines and autocrines) and growth factors.

HAPS Outcome: J06.01 Define the terms paracrine and autocrine.