SECTION 45-1 REVIEW

THE HUMAN BODY PLAN

VOCABULARY REVIEW Describe the functions of the tissues listed below.

1. nervous tissue ____________________________

2. muscular tissue ____________________________

3. skeletal muscle ____________________________

4. epithelial tissue ____________________________

5. connective tissue ____________________________

MULTIPLE CHOICE Write the correct letter in the blank.

1. Nervous tissue contains specialized cells called
   a. transmitters.  b. messenger cells.  c. neurons.  d. cardiac cells.

2. Tissue that binds, supports, and protects structures is called
   a. connective tissue.  b. muscle tissue.  c. skeletal tissue.  d. epithelial tissue.

3. Organ systems consist of
   a. tissues.  b. cells.  c. organs.  d. All of the above

4. The body cavity that contains the heart, esophagus, and organs of the respiratory system is the
   a. cranial cavity.  b. spinal cavity.  c. abdominal cavity.  d. thoracic cavity.

5. Which organ system includes the kidneys, ureters, bladder, urethra, lungs, and skin?
   a. integumentary system  b. digestive system  c. excretory system  d. endocrine system
**SHORT ANSWER** Answer the questions in the space provided.

1. List three types of muscle tissue.

2. Describe how body tissues, organs, and organ systems are related.

3. Describe the composition of connective tissue.

4. Describe two functions of nervous tissue.

5. **Critical Thinking** Can an organ be part of more than one organ system? Explain your answer.

**STRUCTURES AND FUNCTIONS** Use the figure below to answer the following questions.

1. Label each part of the figure in the spaces provided.

2. Which of the labeled body cavities contain the central nervous system?

3. What is the function of the body cavities?
SECTION 45-2 REVIEW

SKELETAL SYSTEM

VOCABULARY REVIEW  Explain the relationship between the terms in each of the following pairs of terms.

1. axial skeleton, appendicular skeleton

2. periosteum, compact bone

3. bone marrow, spongy bone

4. ossification, epiphyseal plate

5. joint, ligament

MULTIPLE CHOICE  Write the correct letter in the blank.

_____ 1. The process in which bone cells gradually replace cartilage is called
   a. ossification.  
   b. osteoarthritis.  
   c. restoration.  
   d. None of the above

_____ 2. The axial skeleton includes bones of the
   a. arms.  
   b. legs.  
   c. ribs.  
   d. All of the above

_____ 3. Semimovable joints are found
   a. in the knees.  
   b. between vertebrae.  
   c. in the thumbs.  
   d. in the elbows.

_____ 4. Tough bands of connective tissue that hold bones in place are called
   a. ligaments.  
   b. tendons.  
   c. gliding joints.  
   d. muscles.

_____ 5. Osteoarthritis is characterized by
   a. stretching of ligaments.  
   b. autoimmunity.  
   c. fracturing of bones.  
   d. thinning of cartilage.
SHORT ANSWER Answer the questions in the space provided.

1. Describe three functions of bones.

2. List three types of joints, and give an example of each type.

3. Describe the importance of bone marrow.

4. Critical Thinking Why is dietary calcium important to bone growth and maintenance?

STRUCTURES AND FUNCTIONS Use the figure of the human skeleton at right to answer the following questions.

1. Label each part of the figure in the spaces provided.

2. What are the primary functions of the skeleton?

3. How do bones elongate?
SECTION 45-3 REVIEW

MUSCULAR SYSTEM

VOCABULARY REVIEW  Distinguish between the terms in each of the following pairs of terms.

1. voluntary muscle, involuntary muscle

2. origin, insertion

3. flexor, extensor

4. actin, myosin

5. muscle fatigue, oxygen debt

MULTIPLE CHOICE  Write the correct letter in the blank.

1. Which of the following types of muscle tissues is found in the walls of the stomach, intestines, and blood vessels?
   a. cardiac muscle  b. smooth muscle  c. skeletal muscle  d. voluntary muscle

2. Which of the following types of muscle tissues is responsible for moving most parts of the body?
   a. cardiac muscle  b. smooth muscle  c. skeletal muscle  d. involuntary muscle

3. A sarcomere
   a. is the functional unit of muscle contraction.  c. uses ATP.
   b. consists of myofibrils.  d. All of the above

4. Muscles that cause a joint to bend are called
   a. flexors.  b. origins.  c. extensors.  d. insertions.

5. Which of the following happens when a skeletal muscle contracts?
   a. Sarcomeres shorten.  c. Myosin heads attach to actin filaments.
   b. Myosin heads bend outward.  d. All of the above
SHORT ANSWER  Answer the questions in the space provided.

1. How does a runner acquire an oxygen debt? ________________________________
   ______________________________________________________________________
   ______________________________________________________________________

2. How does a muscle contract? _____________________________________________
   ______________________________________________________________________
   ______________________________________________________________________

3. Distinguish between the three types of muscle tissue. ________________________
   ______________________________________________________________________
   ______________________________________________________________________

4. Critical Thinking  Why are flexors and extensors considered antagonistic muscles?
   ______________________________________________________________________
   ______________________________________________________________________

STRUCTURES AND FUNCTIONS  Use the figure of the human arm below to answer the
following questions.

1. Label each part of the figure in the spaces provided.
   a
   b
   c
   d
   e
   f
   g
   h

2. Which muscle is a flexor and which muscle is an extensor? ___________________
   ______________________________________________________________________

3. Where is the insertion of a located? Where is the origin of a located? __________
   ______________________________________________________________________
   ______________________________________________________________________
SECTION 45-4 REVIEW

INTEGUMENTARY SYSTEM

VOCABULARY REVIEW  Define the following terms.

1. exocrine gland _____________________________________________________________

2. melanin _________________________________________________________________

3. sebum _________________________________________________________________

4. keratin _________________________________________________________________

5. sweat gland _____________________________________________________________

MULTIPLE CHOICE  Write the correct letter in the blank.

1. The dermis
   a. covers the epidermis.  c. contains nervous tissue and blood vessels.
   b. produces melanin.  d. consists mostly of dead cells.

2. Which of the following is secreted by oil glands in the skin?
   a. melanin  b. sebum  c. keratin  d. sweat

3. Which of the following is not a function of the layer of fat cells beneath the dermis?
   a. produces oil  c. absorbs shock
   b. provides an energy reserve  d. insulates the body

4. Hair and nails are composed primarily of
   a. sebum.  b. keratin.  c. glands.  d. All of the above

5. Sweat glands
   a. secrete sebum into the bloodstream.  c. help maintain a steady body temperature.
   b. stimulate hair follicles.  d. insulate the body.
**SHORT ANSWER** Answer the questions in the space provided.

1. Describe the functions of the skin. 

2. How does exposure to ultraviolet light influence melanin production in the skin?

3. Describe the functions of the epidermis.

4. How are hair and nails similar in structure?

5. **Critical Thinking** What causes freckles and pigmented moles?

**STRUCTURES AND FUNCTIONS** Use the figure below to answer the following questions.

1. Label each part of the figure in the spaces provided.

   a. 
   b. 
   c. 
   d. 
   e. 
   f. 
   g. 
   h. 
   i. 

2. Which structures contain keratin?

3. Explain how the dermis enables the body to interact with the external environment.
Section 45-1

VOCABULARY REVIEW
1. It senses changes in the internal and external environment, interprets sensory information, causes the body to move in response to sensory information, and coordinates voluntary and involuntary activities and regulation of some body processes.
2. It provides structure and support, moves trunks and limbs, and moves substances through the body.
3. It moves the bones in the trunk, limbs, and face.
4. It lines or covers all internal and external body surfaces, providing a protective barrier.
5. It binds, supports, and protects structures in the body.

MULTIPLE CHOICE
1. c  2. a  3. d  4. d  5. c

SHORT ANSWER
1. skeletal, smooth, and cardiac
2. Tissues compose organs, and organs compose organ systems.
3. Connective tissue is characterized by cells that are embedded in matrix.
4. Nervous tissue receives and transmits messages in the form of electrical impulses.
5. Yes; for example, the skin has several functions. As part of the integumentary system, it protects against pathogens and helps regulate body temperature. As part of the excretory system, it excretes waste products.

STRUCTURES AND FUNCTIONS
1. a, cranial cavity; b, spinal cavity; c, thoracic cavity; d, abdominal cavity; e, pelvic cavity
2. the spinal cavity and cranial cavity
3. They protect delicate internal organs and permit some organs, such as the lungs, to expand and contract while remaining securely supported.

Section 45-2

VOCABULARY REVIEW
1. The axial skeleton consists of the skull, ribs, spine, and sternum. The appendicular skeleton consists of bones of the arms, legs, scapula, clavicle, and pelvis.
2. Periosteum covers the bone’s surface. Compact bone is the hard material under the periosteum. Both tissues enable bones to withstand stress.
3. Both are contained within the core of a bone.
4. Bones elongate as ossification of cartilage cells occurs at the epiphyseal plates.
5. Ligaments hold the bones of a joint in place.

MULTIPLE CHOICE
1. a  2. c  3. b  4. a  5. d

SHORT ANSWER
1. Bones provide structure and support, give shape and structure to the body, protect internal organs, and provide a framework for muscles.
2. ball and socket, shoulder; hinge joint, elbow; saddle joint, thumbs; pivot joint, top two vertebrae of the human spine; gliding joint, small bones of foot
3. Red bone marrow produces red and white blood cells, and yellow bone marrow serves as an energy reserve.
4. Bone growth is dependent on the availability of calcium. The bones store calcium. If calcium is needed elsewhere in the body, it is taken from the bones. Therefore, calcium intake is necessary to maintain bone health.

STRUCTURES AND FUNCTIONS
1. a, skull; b, clavicle; c, scapula; d, sternum; e, ribs; f, humerus; g, pelvis; h, radius; i, ulna; j, carpals; k, metacarpals; l, phalanges; m, femur; n, patella; o, tibia; p, fibula; q, tarsals; r, metatarsals; s, phalanges
2. The skeleton provides structure and support, gives shape and structure to the body, protects internal organs, and provides a framework for muscles.
3. Bone cells gradually replace the cartilage at the epiphyseal plate, which are located at the end of long bones and which consist of cartilage cells that divide and form columns, pushing older cells toward the middle of the bone.

Section 45-3

VOCABULARY REVIEW
1. Voluntary muscles can usually be controlled consciously, but involuntary muscles cannot be controlled consciously.
2. The origin is where the muscle attaches to the stationary bone. The insertion is where the muscle attaches to the moving bone.
3. A flexor is a muscle that bends a joint. An extensor is a muscle that straightens a joint.
4. Myosin is a protein that makes up the thick filaments in myofibrils, whereas actin is a protein that makes up the thin filaments of myofibrils.
5. Muscle fatigue is the physiological inability of a muscle to contract. Oxygen debt is a temporary lack of oxygen availability due to sustained strenuous exercise.

MULTIPLE CHOICE
1. b 2. c 3. d 4. a 5. a

SHORT ANSWER
1. through sustained exertion; this occurs if the respiratory and circulatory systems are not able to supply the body with sufficient oxygen to maintain ATP synthesis
2. Myosin and actin filaments interact to shorten the length of a sarcomere. A nerve impulse causes the heads of the myosin filaments to attach to points between the beads of the actin filaments, bending the heads inward and pulling the actin filaments with them. Synchronized shortening of sarcomeres in a muscle causes the muscle to contract.
3. Skeletal muscle tissue is made of elongated cells called muscle fibers. Each fiber has many nuclei. The fibers are crossed by light and dark stripes, which give the tissue its striped appearance. Smooth muscle tissue is made of spindle-shaped cells with a single nucleus that form sheets of muscle tissue. Smooth muscle is surrounded by connective tissue and is not controlled voluntarily. Cardiac muscle, which makes up the walls of the heart, is striated like skeletal tissue and is involuntary. Each cell has a single nucleus.
4. Antagonistic muscles are muscles that work against one another. Therefore, the contractions of flexors and extensors have opposite effects; extensors open a joint, and flexors close a joint.

STRUCTURES AND FUNCTIONS
1. a, biceps; b, insertion; c, radius; d, ulna; e, origin; f, humerus; g, scapula; h, triceps
2. flexor: bicep; extensor: triceps
3. Insertion of a is the radius. Origin of a is the scapula.