

CHAPTER 37—PROTECTION, SUPPORT, AND LOCOMOTION

MULTIPLE CHOICE

- Which type of muscle makes up the heart?
 - cardiac
 - smooth
 - skeletal
 - all of these

ANS: A DIF: B OBJ: 37-7
- A(n) _____ muscle contracts under unconscious control.
 - voluntary
 - involuntary
 - skeletal
 - striated

ANS: B DIF: B OBJ: 37-7
- Contractions of _____ muscle are slow and prolonged.
 - skeletal
 - smooth
 - voluntary
 - all of these

ANS: B DIF: B OBJ: 37-7
- Which type of muscle is found in internal organs?
 - skeletal
 - striated
 - smooth
 - voluntary

ANS: C DIF: B OBJ: 37-7
- Which of the following are bacterial infections of skin oil glands?
 - melanoma
 - sunburn
 - skin dryness
 - acne

ANS: D DIF: B OBJ: 37-2
- What is an effect of aging on the skin?
 - wrinkles
 - sagging
 - dryness
 - all of these

ANS: D DIF: B OBJ: 37-3
- The first reaction of the body to a cut is to restore the integrity of the _____.
 - skin
 - arterioles
 - sweat glands
 - none of these

ANS: A DIF: B OBJ: 37-2
- _____ -degree burns involve the death of epidermal and dermal cells.
 - First
 - Second
 - Third
 - Fourth

ANS: C DIF: B OBJ: 37-2
- By age 20, a person's bones stop growing because _____.
 - bone-forming cells are no longer present
 - less calcium is present in the body
 - hormones cause the growth centers at the ends of bones to degenerate
 - bone cells receive less oxygen and nutrients at that time

ANS: C DIF: B OBJ: 37-6
- Which of the following examples illustrates a pivot joint in use?
 - You wind up to pitch a baseball.
 - You wave good-bye to a friend.
 - You kick a football.
 - You look behind you.

ANS: D DIF: B OBJ: 37-5
- After suffering widespread third-degree burns, the burn victim _____.
 - is unlikely to incur bacterial infection
 - recovers in a short time
 - has a harder time regulating body temperature
 - has slight damage to cells of the dermis

ANS: C DIF: B OBJ: 37-2
- The skin regulates the temperature of the body on a hot day by _____.
 - closing the pores
 - dilating the capillaries
 - constricting the blood
 - reducing access to the exterior

ANS: B DIF: B OBJ: 37-1

COMPLETION

- When an inadequate supply of oxygen is available to meet a muscle cell's oxygen needs, the _____ energy system is the primary source of ATP.
ANS: anaerobic DIF: B OBJ: 37-8
- Muscle strength depends on the _____ of the fibers and the number of fibers that contract at a time.
ANS: thickness DIF: B OBJ: 37-8
- Bones grow in length at the _____ of the bone.
ANS: ends DIF: B OBJ: 37-6
- Bones grow in diameter on the _____ surface of the bone.
ANS: outer DIF: B OBJ: 37-6
- Contraction of _____ muscle, the muscle of internal organs, is slow and prolonged.
ANS: smooth DIF: B OBJ: 37-7
- The mineral _____, found in dairy products, is a critical part of the diet for healthy, strong bones.
ANS: calcium DIF: B OBJ: 37-4
- The _____ produces red blood cells, some white blood cells, and cell fragments involved in blood clotting.
ANS: red marrow DIF: B OBJ: 37-4
- Beneath the scab of a wound, _____ begin to multiply to fill in the gap.
ANS: skin cells DIF: B OBJ: 37-2

37-3

MATCHING

Match each item with the correct statement below. Write the answer in the space provided.

- | | |
|--------------|---------------|
| a. myofibril | f. bursa |
| b. joint | g. melanin |
| c. keratin | h. osteoblast |
| d. marrow | i. ligament |
| e. sarcomere | |
- _____ One of the functional units of a myofibril
 - _____ Smaller fiber in a muscle fiber
 - _____ Band of tissue connecting bone to bone
 - _____ Cell pigment that colors skin and protects it from solar radiation
 - _____ Protein in dead epidermal cells that protects and waterproofs underlying cells
 - _____ Soft tissue that fills center cavities of bones
 - _____ Potential bone cell found in cartilage of embryo
 - _____ Fluid-filled sac between bones
 - _____ Where two or more bones meet
- | | | |
|-----------|--------|-----------|
| 1. ANS: e | DIF: B | OBJ: 37-8 |
| 2. ANS: a | DIF: B | OBJ: 37-8 |
| 3. ANS: i | DIF: B | OBJ: 37-4 |
| 4. ANS: g | DIF: B | OBJ: 37-1 |
| 5. ANS: c | DIF: B | OBJ: 37-1 |
| 6. ANS: d | DIF: B | OBJ: 37-6 |
| 7. ANS: h | DIF: B | OBJ: 37-6 |
| 8. ANS: f | DIF: B | OBJ: 37-5 |
| 9. ANS: b | DIF: B | OBJ: 37-5 |

SHORT ANSWER

- Compare and contrast *epidermis* and *dermis*.
ANS: The epidermis is the outer, thinner portion of the skin. The dermis is the inner, thicker portion of the skin.
DIF: B OBJ: 37-1
- Compare and contrast *voluntary muscle* and *involuntary muscle*.
ANS: Voluntary muscle is under conscious control, whereas involuntary muscle is not under voluntary control.
DIF: B OBJ: 37-7
- Compare and contrast *axial skeleton* and *appendicular skeleton*.
ANS: The axial skeleton includes the skull, the vertebral column, ribs, and sternum. The appendicular skeleton includes the bones of the arms, legs, shoulders, and pelvic girdle.
DIF: B OBJ: 37-4

37-4

4. Compare and contrast *compact bone* and *spongy bone*.

ANS: Compact bone is the outer layer of hard bone. The inner spongy bone is less dense and is filled with holes like a sponge.

DIF: B OBI: 37-6

5. Describe the cause and effects of a sprain.

ANS: Caused by forcible twisting of a joint, a sprain can result in injury to the bursa, ligaments, or tendons of the joint.

DIF: B OBI: 37-5

6. Why is the skin considered an organ? Give two important functions of skin.

ANS: The skin is an organ because it consists of tissues joined together to perform specific activities. Functions of the skin include regulation of body temperature and fluids to maintain homeostasis, protection from physical and chemical damage, and sensing information from the environment.

DIF: B OBI: 37-1

7. Identify the following types of joints: skull, hip, ankle, knee, toe, and neck.

ANS: skull—fixed, hip—ball-and-socket, ankle—gliding, knee—hinge, toe—hinge, neck—pivot

DIF: A OBI: 37-5

8. Why do people apply sunblocks?

ANS: People apply sunblocks to block the sun's ultraviolet rays to help prevent sunburn and skin cancer.

DIF: A OBI: 37-3

9. Why does a third-degree burn heal slowly?

ANS: A third-degree burn destroys the epidermis and dermis. Skin no longer functions and must regrow or be replaced by a skin graft.

DIF: A OBI: 37-2

10. Distinguish the functions of the parts of the skin.

ANS: The epidermal layer contains keratin that produces the tough, waterproof covering of the body. The epidermis also produces melanin, a pigment that protects the skin from the sun. The dermal layer contains blood vessels, nerves that signal sensory information, and hair follicles that regulate temperature. The dermis also produces vitamin D when exposed to ultraviolet light.

DIF: A OBI: 37-1

37-5

11. Explain one beneficial and one harmful effect of exposure to sunlight.

ANS: When exposed to the ultraviolet rays in sunlight, dermis cells produce vitamin D, a nutrient that aids calcium absorption. However, exposure to ultraviolet light can damage skin cells and accelerate the aging process.

DIF: B OBI: 37-3

12. How does the buildup of lactic acid in muscle cells result in more oxygen being delivered to your cells?

ANS: Excess lactic acid in the bloodstream makes the blood more acidic. This stimulates rapid breathing, which supplies more oxygen to the muscle cells. The oxygen breaks down the lactic acid.

DIF: A OBI: 37-7

13. How does the sliding filament theory explain muscle contraction?

ANS: The sliding filament theory states that actin filaments within a sarcomere slide toward one another during contraction. Myosin filaments do not move.

DIF: B OBI: 37-8

14. A paramedic at an accident is aware of pressure points, which are areas where a major blood vessel crosses a bone close to the body's surface. How might the paramedic use these points to stop bleeding?

ANS: Pressing a blood vessel against a bone may provide the only way to control bleeding effectively.

DIF: A OBI: 37-4

15. Bone fractures in children are often different from fractures in adults. Explain why this may be so.

ANS: The composition of a child's bones is different from an adult's bones. A child's bones have more collagen and fewer minerals than an adult's. This makes a child's bones less brittle and less likely to break in two.

DIF: A OBI: 37-6

37-6