Chapter 43 Exercises

Review Questions

1. The forearm consists of the _____.
- **a.** radius and ulna
- **b.** radius and humerus
- **c.** ulna and humerus
- **d.** humerus and carpus

2. The pectoral girdle consists of the _____.
- **a.** clavicle and sternum
- **b.** sternum and scapula
- **c.** clavicle and scapula
- **d.** clavicle and coccyx

3. All of the following are groups of vertebrae except _____.
- **a.** thoracic
- **b.** cervical
- **c.** lumbar
- **d.** pelvic

4. Which of these is a facial bone?
- **a.** frontal
- **b.** occipital
- **c.** lacrimal
- **d.** temporal

5. Which of the following is *not* a true statement comparing exoskeletons and endoskeletons?
- **a.** Endoskeletons can support larger organisms.
- **b.** Only endoskeletons can grow as an organism grows.
- **c.** Exoskeletons provide greater protection of the internal organs.
- **d.** Exoskeletons provide less mechanical leverage.

6. The Haversian canal _____.
- **a.** is arranged as rods or plates
- **b.** contains the bone's blood vessels and nerve fibers
- **c.** is responsible for the lengthwise growth of long bones
- **d.** synthesizes and secretes matrix

7. The epiphyseal plate _____.
- **a.** is arranged as rods or plates
- **b.** contains the bone's blood vessels and nerve fibers
- **c.** is responsible for the lengthwise growth of long bones
- **d.** synthesizes and secretes bone matrix

8. The cells responsible for bone resorption are _____.
- **a.** osteoclasts
- **b.** osteoblasts
- **c.** fibroblasts
- **d.** osteocytes

9. Compact bone is composed of _____.
- **a.** trabeculae
- **b.** compacted collagen
- **c.** osteons
- **d.** calcium phosphate only

10. Osteoporosis is a condition where bones become weak and brittle. It is caused by an imbalance in the activity of which cells?
- **a.** osteoclasts and osteoblasts
- **b.** osteoclasts and osteocytes
- **c.** osteoblasts and chondrocytes
- **d.** osteocytes and chondrocytes

11. While assembling a skeleton of a new species, a scientist points to one of the bones and observes that it looks like the most likely site of leg muscle attachment. What kind of bone did they indicate?
- **a.** sesamoid bone
- **b.** long bone
- **c.** trabecular bone
- **d.** flat bone

12. Synchondroses and symphyses are _____.
- **a.** synovial joints
- **b.** cartilaginous joints
- **c.** fibrous joints
- **d.** condyloid joints

13. The movement of bone away from the midline of the body is called _____.
- **a.** circumduction
- **b.** extension
- **c.** adduction
- **d.** abduction

14. Which of the following is *not* a characteristic of the synovial fluid?
- **a.** lubrication
- **b.** shock absorption
- **c.** regulation of water balance in the joint
- **d.** protection of articular cartilage

15. The elbow is an example of which type of joint?
- **a.** hinge
- **b.** pivot
- **c.** saddle
- **d.** gliding

16. A high ankle sprain is an injury caused by over-stretching the ligaments connecting the tibia and fibula. What type of joint is involved in this sprain?
- **a.** ball-and-socket
- **b.** gomphosis
- **c.** syndesmosis
- **d.** symphysis

17. In relaxed muscle, the myosin-binding site on actin is blocked by _____.
- **a.** titin
- **b.** troponin
- **c.** myoglobin
- **d.** tropomyosin

18. The cell membrane of a muscle fiber is called a _____.
- **a.** myofibril
- **b.** sarcolemma
- **c.** sarcoplasm
- **d.** myofilament

19. The muscle relaxes if no new nerve signal arrives. However, the neurotransmitter from the previous stimulation is still present in the synapse. The activity of _____ helps to remove this neurotransmitter.
- **a.** myosin
- **b.** action potential
- **c.** tropomyosin
- **d.** acetylcholinesterase

20. The ability of a muscle to generate tension immediately after stimulation is dependent on _____.
- **a.** myosin interaction with the M line
- **b.** overlap of myosin and actin
- **c.** actin attachments to the Z line
- **d.** none of these

21. Botulinum toxin causes flaccid paralysis of the muscles and is used for cosmetic purposes under the name Botox. Which of the following is the most likely mechanism of action of Botox?
- **a.** Botox decreases the production of acetylcholinesterase.
- **b.** Botox increases calcium release from the sarcoplasmic reticulum.
- **c.** Botox blocks the ATP binding site in actin.
- **d.** Botox decreases the release of acetylcholine from motor neurons.

Critical Thinking Questions

22. What are the major differences between the male and female pelvis that permit childbirth in females?

23. What are the major differences between the pelvic girdle and the pectoral girdle that allow the pelvic girdle to bear the weight of the body?

24. Both hydrostatic and exoskeletons can protect internal organs from harm. Contrast the ways the skeletons perform these functions.

25. Scoliosis is a medical condition where the spine develops a sideways curvature. How would this change interfere with the normal function of the spine?

26. What are the major differences between spongy bone and compact bone?

27. What are the roles of osteoblasts, osteocytes, and osteoclasts?

28. Thalidomide was a morning sickness drug administered during pregnancy that caused babies to be born without arm bones. If recent studies have shown that thalidomide prevents the formation of new blood vessels, describe the type of bone development inhibited by the drug and what stage of ossification was affected.

29. What movements occur at the hip joint and knees as you bend down to touch your toes?

30. What movement(s) occur(s) at the scapulae when you shrug your shoulders?

31. Describe the joints and motions involved in taking a step forward if a person is initially standing still. Assume the person holds their foot at the same angle throughout the motion.

32. How would muscle contractions be affected if ATP were completely depleted in a muscle fiber?

33. What factors contribute to the amount of tension produced in an individual muscle fiber?

34. What effect will low blood calcium have on neurons? What effect will low blood calcium have on skeletal muscles?

35. Skeletal muscles can only produce a mechanical force as they are contracted, but a leg flexes and extends while walking. How can muscles perform this task?