

Name \_\_\_\_\_

Skeletal

1. The ulna is an example of a(n) \_\_\_\_\_ bone.  
A. long  
B. short  
C. sutural  
D. irregular  
E. flat
  
2. Osteoclasts  
A. participate in osteogenesis.  
B. participate in osteolysis.  
C. mature once they are closed off in their lacunae.  
D. are differentiated osteoprogenitor cells.
  
3. In response to a person's question "How are you feeling?" you shake your hand in a so-so fashion (side-to-side). This movement would be considered  
A. circumduction.  
B. pronation/supination.  
C. abduction/adduction.  
D. protraction/retraction.
  
4. Most of the bones in the body will originally form via  
A. appositional growth only.  
B. intramembranous ossification.  
C. interstitial growth.  
D. endochondral ossification.
  
5. The periosteum is important for  
A. appositional growth.  
B. keeping bone separate from surrounding tissues.  
C. providing a route for blood vessels and nerves to enter the bone.  
D. All of the above are functions of the periosteum.
  
6. When the nucleus pulposus of an intervertebral disc breaks through the annulus fibrosus and distorts sensory nerves, the condition is called a  
A. herniated disc.  
B. slipped disc.  
C. luxation.  
D. subluxation.  
E. bursitis.
  
7. The pubic symphysis is an example of a(n)  
A. diarthrosis.  
B. amphiarthrosis.  
C. synarthrosis.  
D. synchondrosis.  
E. syndesmosis.

8. The functional unit of compact bone is the
- A. osteoid.
  - B. osteon.
  - C. osteocyte.
  - D. canaliculi.
  - E. diaphysis.
9. Compound fractures are more dangerous than simple fractures. Why?
- A. The bone is shattered in a compound fracture and the fragments can perforate an organ.
  - B. Compound fractures cause excessive internal bleeding, and are therefore more difficult to treat.
  - C. Simple fractures have only one break in the bone but compound fractures have multiple breaks in the bone.
  - D. Compound fractures break through the skin, increasing the chance of an infection or uncontrollable bleeding.
10. When the calcium concentration in the blood is above normal levels,
- A. parathyroid hormone will be released.
  - B. calcitriol will be synthesized.
  - C. osteoclast activity will increase.
  - D. osteoprogenitor activity will decrease.
  - E. calcium excretion from the kidneys will increase.

### Muscle

11. A person with good muscle tone
- A. will be able to withstand a sudden shock better than someone without good muscle tone.
  - B. will have a faster metabolism than if she did not have good muscle tone.
  - C. will appear more fit and healthy even at rest.
  - D. will be able to recruit other motor units faster to perform a specific task.
  - E. All of the above are correct.
12. Every muscle fiber is surrounded and connected to other muscle fibers by the
- A. epimysium.
  - B. perimysium.
  - C. endomysium.
  - D. sarcoplasmic reticulum.
13. The purpose of a triad is
- A. to allow an action potential to travel down to the area where calcium ions are stored, thereby causing  $\text{Ca}^{2+}$  to be released into the sarcoplasm of a muscle fiber.
  - B. to organize the thick and thin filaments in a pattern that gives skeletal muscle its striated appearance.
  - C. to provide a space for neurotransmitters to cross from a neuron to a muscle fiber.
  - D. to increase the surface area of the motor end plate, thereby creating a more efficient means of propagating an action potential from the motor neuron to the muscle fiber.

14. A newly discovered autoimmune disease results in the junctional folds of the motor end plates gradually being smoothed out. What will the effect of this disease be?
- A. Sustained muscular contractions.
  - B. Nothing, because the receptors are still present on the motor end plate.
  - C. Less stimulation arriving from the motor neuron.
  - D. Increased rate of breakdown of acetylcholine.
  - E. Progressive muscular weakness and eventual paralysis.
15. The majority of energy provided during peak activity, such as sprinting, is from
- A. glycolysis.
  - B. aerobic metabolism.
  - C. fatty acid breakdown.
  - D. creatine phosphate.
16. In order for contraction to occur,
- A. sodium ions have to bind to troponin.
  - B. the troponin-tropomyosin complex has to bind to ATP.
  - C. calcium ions have to bind to the troponin-tropomyosin complex.
  - D. ATP has to be present for the actin-myosin cross-bridge to form.
17. Fast muscle fibers are utilized the most during
- A. resting conditions.
  - B. peak activities like sprinting.
  - C. moderate activities like long-distance running.
  - D. a walk in the park.
18. A contraction will end when
- A. calcium ions bind to troponin.
  - B. tropomyosin moves, exposing the myosin active sites on actin.
  - C. a motor neuron is stimulated.
  - D. calcium ions are actively transported back into the terminal cisternae of the sarcoplasmic reticulum.
19. The process of excitation includes all of the following EXCEPT
- A. an action potential traveling down the axon of a motor neuron.
  - B. acetylcholine binding to receptors in the motor end plate of a muscle fiber.
  - C. exocytosis of vesicles containing acetylcholine.
  - D. sodium ions crossing the synaptic cleft.
20. As you are lifting a heavy load,
- A. smaller motor units are activated first, and then larger motor units are recruited.
  - B. large motor units are activated first, and then smaller motor units are recruited.
  - C. a sustained tetanic contraction is achieved when all motor units are actively contracting at one time.
  - D. smaller motor units, with their fast contracting fibers, fatigue first, and then large motor units will do the work.

21. Immediately after death, ATP is no longer produced. What effect will this have on muscle contractions?
- A. All muscle contractions will immediately stop because there are no more action potentials traveling down the motor neuron.
  - B. The cross-bridges will not be able to detach, so muscles that were previously contracted will remain contracted until lysosomal enzymes break down the myofilaments.
  - C. Cross-bridges of all sarcomeres will form because of the sudden rush of calcium ions into the sarcoplasm, causing a total body contraction.
  - D. Muscle contractions will not be able to occur because acetylcholinesterase won't have the energy required for its function.
22. With an isometric contraction
- A. tension develops to an equal level that the resistance requires.
  - B. the length of the muscle will shorten.
  - C. the length of the muscle will get longer.
  - D. tension develops to the peak level, but that level is not great enough to overcome the resistance of the object.
23. Moderate activity such as jogging
- A. can only be sustained for short periods of time due to lactic acid build-up.
  - B. provides enough oxygen for aerobic metabolism to occur.
  - C. allows energy reserves to be replenished during the activity.
  - D. requires fatty acids as sole substrates for energy production.
24. Muscle fatigue
- A. will not occur with moderate activity.
  - B. occurs in long-distance athletes when lactic acid levels increase.
  - C. occurs when muscles can no longer perform at a certain level of activity.
  - D. will only happen to sprinters after creatine phosphate levels have decreased.
25. After exercising, the body has to restore normal conditions. All of the following are ways the body will return to normal resting conditions EXCEPT
- A. breathing rate and depth will increase.
  - B. the Cori cycle will be active.
  - C. the person will fall asleep.
  - D. dermal blood vessels will dilate.
26. Aerobic endurance
- A. causes muscle hypertrophy.
  - B. causes muscle atrophy.
  - C. will increase the ability of slow muscle fibers to utilize mitochondria for energy production.
  - D. will increase the length of time a contraction of a fast muscle fiber can continue with the given energy substrates.