A/P: Muscle Physiology Take-Home Exam

True/False:

1. _____ Actin myofilaments are attached to the z-line.
2. _____ Cardiac muscles are like skeletal muscles except cardiac muscles are voluntary.
3. _____ Cell is to tissue as sarcomere is to muscle.
4. _____ At resting potential, acetylcholine is contained within vesicles.
5. _____ ATP is a type of neurotransmitter.
6. _____ Excitability is a characteristic of skeletal muscles.
7. _____ Long distance runners have a larger percentage of slow-twitch muscle fibers.
8. _____ The ability to sit upright and attentive in your seat during tedious English lectures is an example of your body using muscle tone.
9. _____ Aerobic respiration promotes the buildup of lactic acid due to lack of oxygen.
10. _____ Myofilaments are attached to the M-line near the middle of a sarcomere.

Multiple Choice:

11. Skeletal muscles…
    a. require energy in order to contract.
    b. require energy in order to relax
    c. relax when calcium ions are transported into sarcoplasmic reticulum.
    d. All of the above.

12. A weight lifter attempts to lift a weight from the floor, but the weight is so heavy he is unable to move it. The type of muscle contraction the weight lifter used was mostly.
    a. Isometric
    b. Isotonic
    c. plyometric
    d. hypotonic

13. Muscles that oppose one another are…
    a. synergists
    b. prime movers
    c. antagonists
    d. protagonists

14. ATP…
    a. attaches to the myosin filament.
    b. Provides energy for the movement of the myosin filament.
    c. Is required for muscle contractions.
    d. Releases part of its energy as heat
    e. Both b and c

15. Each sarcomere…
    a. extends from one Z line to the next Z line.
    b. has an H zone in the center.
    c. contains parts of two bands, the I bands and the A band.
    d. contains overlapping myosin and actin filaments.
    e. All of the above.

16. A motor neuron is…
    a. a single group of neurons that attach to many neuromuscular junctions.
    b. Junction of synapse where the motor neuron attaches to the muscle.
    c. A nerve cell that carries the action potential to skeletal muscles.

17. Contractility is the ability of a muscle to…
    a. shorten.
    b. respond to a nerve stimulus
    c. stretch beyond the resting state.
    d. return to a resting state after the muscle is stretched

18. Excitability is the ability of a muscle to
    a. shorten.
    b. respond to a nerve stimulus.
    c. stretch beyond the resting state.
    d. return to a resting state after the muscle is stretched.

19. Elasticity is the ability of a muscle to
    a. shorten.
    b. respond to a nerve stimulus.
    c. stretch beyond the resting state.
    d. return to a resting state after the muscle is stretched.

20. Neuromuscular junction is…
    a. a single group of neurons that attach to many neuromuscular junctions.
    b. a synaptic junction where the motor neuron attaches to the muscle.
    c. A nerve cell that carries the action potential to skeletal muscles.

21. The Z-line is
    a. the point of attachment for the myosin filaments.
    b. the point of attachment for the actin filaments.
    c. the boundary of the sarcomere.
    d. Both b and c

22. Given the following events:
    1. acetylcholine broken down
    2. acetylcholine moves across the synaptic cleft
    3. action potential reaches the presynaptic terminal of a motor neuron.
    4. acetylcholine combines with a receptor molecule on a skeletal muscle.
    5. action potential produced in a skeletal muscle cell.

    Choose the arrangement that lists the events in the order they occur at a neuromuscular junction.
    a. 2,3,4,1,5
    b. 3,2,4,5,1
    c. 3,4,2,1,5
    d. 4,5,2,1,3

23. What chemical builds up in the muscle during anaerobic muscle movement?
    a. ATP
    b. Calcium
    c. Lactic Acid
    d. Potassium

For the following questions, compose your answers on a separate sheet of paper.

Use your notes to explain how the following conditions affect the ability of a muscle to contract effectively. Please rephrase the question in each answer.

1. Low sodium in the body.
2. Low calcium in the body.
3. Inability to produce adequate acetylcholinesterase
4. Inability of the body to convert ATP into creatine phosphate.
5. Low amounts of ATP in the body.