Biology 121 **Test 6** Fall 2010

**DETERMINE THE ONE MOST CORRECT ANSWER TO THE QUESTION AND PLACE THE ANSWER IN THE CORRECT SPACE ON THE ANSWER SHEET.**

1. Which of the following is/are voluntary muscle? **2.3**
   1. Smooth muscle
   2. Cardiac muscle
   3. Skeletal muscle
   4. All of the above
2. All of the following properties are essential to the function of muscle tissue except **2.3**
   1. Excitability
   2. Striations
   3. Extensibility
   4. Elasticity
   5. Contractility
3. Action potentials are propagated from the surface to the interior of a muscle fiber by way of
   1. The sarcomeres **2.3**
   2. The sarcoplasmic reticulum
   3. The endomysium
   4. The T tubules
4. Rigor mortis occurs because **3.4**
   1. Potassium ions leak into the muscle.
   2. Sodium ions leak out of the muscle.
   3. Cells are not making ATP to release the attached actin and myosin molecules.
   4. Proteins are beginning to break down, thus preventing a flow of calcium ions
5. In a relaxed muscle fiber, the active sites of actin are blocked by **2.3**
   1. Tropomyosin
   2. Troponin
   3. Calcium ions
   4. Myosin heads
6. Each end of a sarcomere is marked by **2.3**
   1. Terminal cisternae
   2. An I band
   3. An A band
   4. A Z disc
7. Synaptic vesicles are found in **2.3**
   1. The synaptic cleft
   2. The pre-synaptic axon terminus
   3. The motor end plate
   4. The junctional folds
8. The bright red color of skeletal muscle is due mainly to its **2.3**
   1. Myoglobin
   2. Troponin
   3. Tropomyosin
   4. Myosin
9. The sliding filament model of contraction involves **2.3**
   1. actin and myosin sliding past each other but not shortening
   2. the shortening of thick filaments so that thin filaments slide past
   3. actin and myosin shortening but not sliding past each other
   4. the Z discs sliding over the myofilaments
10. The region of a sarcomere where actin and myosin overlap in a resting muscle is **2.3**
    1. The Z disc
    2. The H band
    3. The A band
    4. The I band
11. When there is not enough oxygen to create ATP by aerobic respiration, a muscle fiber can produce ATP by borrowing phosphate groups from **3.4**
    1. Cyclic adenosine monophosphate
    2. Creatine phosphate
    3. Phospholipids
    4. Cholinesterase
    5. Creatine kinase
12. Athletes sometimes complain of oxygen debt, a condition that results when insufficient oxygen is available to completely break down pyruvic acid. As a result, the pyruvic acid is converted to
    1. a strong base **3.4**
    2. stearic acid
    3. hydrochloric acid
    4. lactic acid
13. Which of the following is **NOT** characteristic of smooth muscle? **2.3**
    1. Only one nucleus in each cell
    2. A lack of striations
    3. A lack of perimysium and epimysium
    4. A very extensive sarcoplasmic reticulum
    5. An absence of T tubules
14. Which of these processes occurs during the contraction of skeletal muscle? **2.3**
    1. Calcium ions are taken up by the terminal cisternae
    2. The myofilaments become shorter
    3. Calcium ions dissociate from troponin
    4. Z discs move closer together
15. Theoretically, if a muscle were stretched to the point where thick and thin filaments no longer overlapped: **2.3**
    1. Cross bridge attachment would be optimum
    2. No muscle tension could be generated
    3. Maximum force production would result
    4. ATP consumption would increase since the sarcomere is “trying” to contract
16. The loss of muscle mass from disuse is called **3.4**
    1. Tetanus
    2. Atrophy
    3. Dystrophy
    4. Myopathy
17. A motor unit is **2.3**
    1. One neuromuscular junction
    2. One thick filament and all thin filaments with which it forms cross bridges
    3. One nerve fiber and all the muscle fibers innervated by it
    4. One myofibril of a muscle fiber
18. In smooth muscle, some of the calcium needed for contraction comes from **2.3**
    1. The sarcoplasm
    2. Intercalated discs
    3. The motor nerve fiber
    4. The extracellular fluid
19. If a poison inhibits the activity of acetylcholinesterase, a muscle **3.4**
    1. May be unable to relax
    2. May be unable to contract
    3. Will fatigue more quickly
    4. Will fatigue more slowly
20. The striations of a skeletal muscle cell are produced, for the most part by **2.3**
    1. A difference in the thickness of the sarcolemma
    2. Arrangement of myofilaments
    3. The sarcoplasmic reticulum
    4. The T-tubules
21. Which generalization concerning movement by skeletal muscles is **NOT** true? **2.3**
    1. Muscles produce movement by pulling bones
    2. During contraction the two articulating bones move equally
    3. The bones serve as levers
    4. The movements produced may be of graded intensity
22. Muscle tone is **3.4**
    1. The ability of a muscle to efficiently cause skeletal movements
    2. The feeling of well-being following exercise
    3. The constant tension produced by muscles of the body over long periods of time
    4. The condition of athletes after intensive training
23. The force developed by a skeletal muscle depends on **ALL** of the following **EXCEPT 2.3**
    1. The rate of conduction of the muscle action potential along the sarcolemma
    2. The number of motor units recruited
    3. The length of the muscle fiber prior to contraction
    4. The frequency of stimulation
    5. The size of motor units recruited
24. To produce horizontal wrinkles in the forehead, which muscle is involved? **2.3**
    1. The medial pterygoid
    2. The zygomaticus major
    3. The frontalis
    4. The temporalis
25. A smile is produced by contraction of the \_\_\_\_\_ muscle. **2.3**
    1. Frontalis
    2. Zygomaticus
    3. Orbicularis oris
    4. Buccinator
26. The pronator teres and pronator quadrates **2.3**
    1. Depress the scapula
    2. Rotate the scapula
    3. Turn the palm upward
    4. Turn the palm downward
27. In flexing the forearm at the elbow, the **2.3**
    1. biceps brachii acts as antagonist
    2. triceps brachii acts as antagonist
    3. brachioradialis acts as antagonist
    4. coracobrachialis acts as antagonist
28. Which of the following is not a muscle of the lower extremity? **2.3**
    1. Sartorius
    2. Adductor magnus
    3. Semitendinosus
    4. Flexor carpi ulnaris
29. Which of the following muscles is not externally visible on the trunk of the body? **2.3**
    1. Latissimus dorsi
    2. Transversus abdominis
    3. Trapezius
    4. Pectoralis major
30. The quadriceps femoris includes all of the following parts **EXCEPT** the **2.3**
    1. Vastus medialis
    2. Rectus femoris
    3. Vastus intermedius
    4. Vastus femoris
31. The \_\_\_\_\_ is one of the hamstring muscles on the posterior side of the thigh. **2.3**
    1. Semimembranosus
    2. Adductor magnus
    3. Gluteus minimus
    4. Tensor fasciae latae
32. Tendinous insertions divide the \_\_\_\_\_ into segments externally visible on a well-muscled person. **2.3**
    1. Vastus lateralis
    2. Biceps brachii
    3. Serratus anterior
    4. Rectus abdominis

**(33-43).** Write the word(s) that is defined by the statement or completes the sentence.

1. Muscle that produces the main force in a given joint action **2.3**
2. Synergist of the biceps brachii **2.3**
3. Thick main chewing muscle **2.3**
4. Muscle fibers are arranged in bundles called \_\_\_\_\_. **2.3**
5. The largest muscle of the upper back is the \_\_\_\_\_. **2.3**
6. An autoimmune disorder in which the patient loses acetylcholine receptors. **3.4**
7. Muscular weakness caused by a mutation in the dystrophin gene. **3.4**
8. Holds parts of the body in proper position for the action of other muscles, primarily postural muscles. **2.3**
9. Acts to reverse or act against the action of another muscle. **2.3**
10. Synergist of gastrocnemius **2.3**
11. Antagonist of zygomaticus **2.3**
12. Thoracic volume is increased during normal breathing by the **3.4**
    1. Internal intercostals
    2. External oblique
    3. Diaphragm
    4. Trapezius
    5. Both B and C are correct
13. The eye is closed by the **2.3**
    1. Orbicularis oris
    2. Buccinator
    3. Orbicularis oculi
    4. Platysma
    5. Frontalis
14. The arm is extended, medially rotated, and adducted by the **2.3**
    1. Latissimus dorsi
    2. Triceps brachii
    3. Biceps brachii
    4. Sternocleidomastoid
15. A nursing infant develops a powerful sucking muscle that adults also use for whistling called the
    1. Platysma **2.3**
    2. Buccinator
    3. Zygomaticus
    4. Masseter
16. An experienced jogger comes to a clinic complaining of excruciating pain in her shin. Recently she changed her route to include a hilly area, and now she experiences pain after running downhill. Which muscle is now receiving an unusual amount of extra pressure? **3.4**

**(49 – 51).** Identify the following contractions of the biceps brachii muscle. **2.3**

1. Lifting a glass off the table a. concentric isotonic
2. Holding a glass in the same position b. eccentric isotonic
3. Lowering a glass to the table c. isometric

**(52 – 55).**  Match the fascicle arrangement with the description. **2.3**

1. Fascicles insert into a midline tendon from both sides.
2. Muscle fibers are arranged in concentric array around an opening.
3. Fascicles run with the long axis of the muscle.
4. Fascicles angle from a broad origin to a narrow insertion.

**(56 – 59).** Match the terms with the correct statement or definition. Choices may be used once, more than once, or not at all.

56. The myosin-ATPase breaks down ATP the slowest. a. muscular fatigue **2.3**

57. Uses oxygen to produce ATP, has the best blood supply, b. psychologic fatigue **2.3**

many mitochondria, large amounts of myoglobin

58. Produces ATP without oxygen, poorest blood supply, high c. FG fibers **2.3**

Glycogen and low myoglobin content

59. Muscles are capable of functioning, but the person d. FO fibers **3.4**

“perceives” work is not possible

Biology 121 – Test 6

Data obtained November 23, 2010

N = 22

|  |  |  |  |  |
| --- | --- | --- | --- | --- |
| **Question #** | **MPO** | **# Correct** | **Percentage** | **Average for same MPO** |
| 1 | **2.3** | 22 | 100 |  |
| 2 | **2.3** | 18 | 82 |  |
| 3 | **2.3** | 18 | 82 |  |
| 4 | **3.4** | 18 | 82 |  |
| 5 | **2.3** | 12 | 55 |  |
| 6 | **2.3** | 19 | 86 |  |
| 7 | **2.3** | 12 | 55 | **65.6%** |
| 8 | **2.3** | 19 | 86 | **69.9%** |
| 9 | **2.3** | 13 | 59 |  |
| 10 | **2.3** | 12 | 55 |  |
| 11 | **3.4** | 18 | 82 |  |
| 12 | **3.4** | 22 | 100 |  |
| 13 | **2.3** | 10 | 45 |  |
| 14 | **2.3** | 13 | 59 |  |
| 15 | **2.3** | 15 | 68 |  |
| 16 | **3.4** | 17 | 77 |  |
| 17 | **2.3** | 15 | 68 |  |
| 18 | **2.3** | 13 | 59 |  |
| 19 | **3.4** | 12 | 55 |  |
| 20 | **2.3** | 16 | 73 |  |
| 21 | **2.3** | 20 | 91 |  |
| 22 | **3.4** | 12 | 55 |  |
| 23 | **2.3** | 5 | 23 |  |
| 24 | **2.3** | 19 | 86 |  |
| 25 | **2.3** | 19 | 86 |  |
| 26 | **2.3** | 12 | 55 |  |
| 27 | **2.3** | 13 | 59 |  |
| 28 | **2.3** | 20 | 91 |  |
| 29 | **2.3** | 15 | 68 |  |
| 30 | **2.3** | 10 | 45 |  |
| 31 | **2.3** | 15 | 68 |  |
| 32 | **2.3** | 19 | 86 |  |
| 33 | **2.3** | 15 | 68 |  |
| 34 | **2.3** | 11 | 50 |  |
| 35 | **2.3** | 16 | 73 |  |
| 36 | **2.3** | 15 | 68 |  |
| 37 | **2.3** | 13 | 59 |  |
| 38 | **3.4** | 7 | 32 |  |
| 39 | **3.4** | 20 | 91 |  |
| 40 | **2.3** | 3 | 14 |  |

|  |  |  |  |  |
| --- | --- | --- | --- | --- |
| **Question #** | **MPO** | **# Correct** | **Percentage** | **Average for same MPO** |
| 41 | **2.3** | 17 | 77 |  |
| 42 | **2.3** | 9 | 41 |  |
| 43 | **2.3** | 12 | 55 |  |
| 44 | **3.4** | 16 | 73 |  |
| 45 | **2.3** | 19 | 86 |  |
| 46 | **2.3** | 13 | 59 |  |
| 47 | **2.3** | 22 | 100 |  |
| 48 | **3.4** | 6 | 27 |  |
| 49 | **2.3** | 16 | 73 |  |
| 50 | **2.3** | 19 | 86 |  |
| 51 | **2.3** | 16 | 73 |  |
| 52 | **2.3** | 9 | 41 |  |
| 53 | **2.3** | 18 | 82 |  |
| 54 | **2.3** | 11 | 50 |  |
| 55 | **2.3** | 12 | 55 |  |
| 56 | **2.3** | 12 | 55 |  |
| 57 | **2.3** | 8 | 36 |  |
| 58 | **2.3** | 14 | 64 |  |
| 59 | **3.4** | 21 | 95 |  |