

1. Which type of muscle tissue is primarily voluntary and striated?
 - A) Smooth muscle
 - B) Skeletal muscle
 - C) Cardiac muscle
 - D) Visceral muscle
2. The alternating light and dark bands in skeletal muscle are due to:
 - A) The presence of mitochondria
 - B) The alignment of actin and myosin filaments
 - C) The shape of nuclei
 - D) Connective tissue layering
3. The diaphragm's rhythmic contraction without conscious control is an example of:
 - A) Involuntary control
 - B) Voluntary regulation
 - C) Mixed control (voluntary and involuntary)
 - D) Reflex inhibition
4. Cardiac muscle exhibits autorhythmicity because:
 - A) It receives signals from the brain
 - B) It has its own natural pacemaker
 - C) It depends entirely on hormonal stimulation
 - D) It has no neuromuscular junction
5. The pacemaker of the heart can be influenced by:
 - A) Somatic motor neurons
 - B) Hormones and neurotransmitters
 - C) Voluntary brain control
 - D) Skeletal muscle contraction
6. Smooth muscle found in the gastrointestinal tract is considered:
 - A) Striated and voluntary
 - B) Non-striated and autorhythmic
 - C) Striated and involuntary
 - D) Non-striated and somatic

7. Which of the following is NOT a function of muscular tissue?

- A) Generating heat
- B) Storing calcium ions
- C) Stabilizing body positions
- D) Moving substances within the body

8. Thermogenesis refers to:

- A) Heat loss during sweating
- B) Heat production during muscle contraction
- C) Maintenance of homeostasis by blood vessels
- D) Cooling during muscle relaxation

9. The ability of muscle tissue to stretch without being damaged is called:

- A) Elasticity
- B) Extensibility
- C) Contractility
- D) Irritability

10. Electrical excitability refers to:

- A) Ability to contract
- B) Ability to generate action potentials in response to stimuli
- C) Ability to stretch and recoil
- D) Ability to produce heat

11. Which connective tissue structure surrounds and supports muscles and organs?

- A) Epimysium
- B) Fascia
- C) Endomysium
- D) Sarcolemma

12. The subcutaneous layer plays a key role in:

- A) Fat storage and insulation
- B) Conducting electrical impulses
- C) Generating ATP
- D) Storing calcium ions

13. Somatic motor neurons control:

- A) Smooth muscles
- B) Cardiac muscles
- C) Skeletal muscles
- D) All types of muscles

14. The sarcolemma of a muscle cell functions as:

- A) Storage site for calcium
- B) The plasma membrane conducting impulses
- C) Structural support for myofibrils
- D) A region containing glycogen granules

15. T-tubules serve primarily to:

- A) Conduct muscle impulses deep into the fiber
- B) Store calcium ions
- C) Synthesize myoglobin
- D) Transport oxygen

16. The sarcoplasm contains large amounts of glycogen and:

- A) Actin
- B) Myoglobin
- C) ATPase
- D) Tropomyosin

17. The function of myoglobin is to:

- A) Store calcium
- B) Bind and release oxygen for ATP production
- C) Synthesize glycogen
- D) Conduct impulses

18. The sarcoplasmic reticulum stores:

- A) Sodium ions
- B) Calcium ions
- C) Potassium ions
- D) Chloride ions

19. The basic functional unit of a myofibril is the:

- A) Myofilament
- B) Sarcolemma
- C) Sarcomere
- D) Myofiber

20. Thin filaments are primarily composed of:

- A) Myosin
- B) Actin
- C) Titin
- D) Dystrophin

21. The Z disc serves as:

- A) The site of myosin attachment
- B) The boundary between sarcomeres
- C) The energy storage site
- D) The point where the SR connects to T-tubules

22. The A band corresponds to:

- A) Regions containing only thin filaments
- B) The area of thick filaments
- C) The H zone only
- D) The overlap of thick and thin filaments

23. Which protein functions as the motor of muscle contraction?

- A) Actin
- B) Troponin
- C) Myosin
- D) Tropomyosin

24. The main function of regulatory proteins is to:

- A) Produce ATP
- B) Turn contraction on and off
- C) Maintain elasticity
- D) Store calcium

25. Tropomyosin blocks the myosin-binding sites on actin in:

- A) Relaxed muscle
- B) Contracted muscle
- C) Fatigued muscle
- D) Damaged muscle

26. When calcium binds to troponin, it causes:

- A) Myosin to detach from actin
- B) Tropomyosin to uncover binding sites on actin
- C) ATP hydrolysis
- D) Sarcolemma depolarization

27. Titin helps muscles:

- A) Generate power
- B) Return to resting length after contraction
- C) Conduct nerve impulses
- D) Produce ATP

28. During muscle contraction, which of the following remains unchanged?

- A) H zone
- B) I band
- C) A band
- D) Sarcomere length

29. The sliding filament mechanism explains muscle shortening due to:

- A) Folding of myosin
- B) Sliding of filaments past each other
- C) Filament length reduction
- D) Expansion of sarcomeres

30. The power stroke occurs when:

- A) Myosin releases phosphate and ADP
- B) ATP binds to the myosin head
- C) Calcium is reabsorbed
- D) Actin detaches from myosin

31. The cross-bridge detaches from actin when:

- A) Calcium binds to troponin
- B) ATP binds to the myosin head
- C) Tropomyosin covers binding sites
- D) ADP is released

32. Which event links excitation to contraction?

- A) Action potential propagation along the sarcolemma
- B) ATP binding
- C) Calcium release from the SR
- D) Myosin-actin detachment

33. Each thick filament contains approximately how many cross-bridges?

- A) 60
- B) 600
- C) 6000
- D) 60,000

34. The neuromuscular junction is a type of:

- A) Electrical synapse
- B) Chemical synapse
- C) Gap junction
- D) Reflex arc

35. A motor unit is defined as:

- A) One muscle fiber and several neurons
- B) A single neuron and all muscle fibers it innervates
- C) Multiple neurons acting on one fiber
- D) A single sarcomere

36. The sarcomere shortens during contraction while the thick and thin filament lengths remain constant.

37. Calcium ions are stored primarily in the mitochondria.

38. Troponin directly blocks myosin-binding sites on actin.

39. The I band shortens during contraction, but the A band remains the same.
40. ATP is required for both muscle contraction and relaxation.
41. Each muscle fiber can divide to form new fibers after injury.
42. The H zone contains only thin filaments.
43. Myosin heads function as ATPases.
44. The neuromuscular junction connects a sensory neuron to a muscle fiber.
45. Cardiac muscle contraction depends entirely on somatic motor neurons.

Answer Key: 1-B 2-B 3-C 4-B 5-B 6-B 7-B 8-B 9-B 10-B 11-B 12-A 13-C 14-B 15-A 16-B
17-B 18-B 19-C 20-B 21-B 22-D 23-C 24-B 25-A 26-B 27-B 28-C 29-B 30-A 31-B 32-C
33-B 34-B 35-B 36-T 37-F 38-F 39-T 40-T 41-F 42-F 43-T 44-F 45-F