

Advanced Exercise Physiology and Human Anatomy

Exercise Science · Practice Test · 12 Questions

1. Which specific protein filament is primarily responsible for the 'power stroke' during skeletal muscle contraction?

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

2. In the context of the Frank-Starling Law, what is the primary determinant of increased stroke volume?

- A) Increased end-diastolic volume
- B) Decreased systemic vascular resistance
- C) Increased parasympathetic stimulation
- D) Decreased myocardial contractility

3. During sustained submaximal aerobic exercise, which metabolic byproduct is increasingly utilized by the heart muscle for energy?

- A) Glucose
- B) Lactate
- C) Glycerol
- D) Palmitate

4. Which muscle fiber type is characterized by high mitochondrial density, slow contraction speed, and high resistance to fatigue?

- A) Type IIx
- B) Type IIa
- C) Type I
- D) Type IIb

5. What is the primary physiological mechanism by which the Bohr effect enhances oxygen delivery to tissues?

- A) Increased pH in the blood
- B) Decreased partial pressure of CO₂
- C) Rightward shift of the oxyhemoglobin dissociation curve
- D) Inhibition of 2,3-DPG production

6. Which structural unit of a muscle fiber is defined as the region between two consecutive Z-discs?

- A) Sarcomere
- B) Myofibril
- C) Sarcoplasmic reticulum
- D) T-tubule

7. What is the net gain of ATP molecules produced through substrate-level phosphorylation in the glycolytic pathway?

- A) 1
- B) 2
- C) 4
- D) 36

8. Which hormonal response is specifically triggered by high-intensity resistance training to stimulate protein synthesis?

- A) Increased secretion of cortisol
- B) Decreased secretion of testosterone
- C) Increased pulsatile release of growth hormone
- D) Inhibition of insulin-like growth factor 1

9. What is the primary anatomical site for the integration of sensory input to adjust motor output during complex movement?

- A) Cerebellum
- B) Medulla oblongata
- C) Pons
- D) Hypothalamus

10. Which enzyme is the rate-limiting factor in the glycolysis pathway?

- A) Hexokinase
- B) Phosphofructokinase
- C) Pyruvate kinase
- D) Lactate dehydrogenase

11. In an eccentric muscle contraction, what occurs at the molecular level regarding cross-bridge formation?

- A) Actin and myosin filaments slide toward the M-line
- B) Cross-bridges form and break while the muscle lengthens
- C) Myosin heads remain permanently bound to actin
- D) The Z-discs move closer together

12. Which structure within the muscle cell is responsible for the storage and controlled release of calcium ions?

- A) Sarcolemma
- B) Sarcoplasmic reticulum
- C) Mitochondria
- D) Lysosomes