Advanced Sports Science Assessment

Sports Science · Answer Key · 8 Questions

1. Which specific muscle fiber type is characterized by high mitochondrial density, significant myoglobin content, and a primary reliance on oxidative phosphorylation for ATP production?

A) Type IIx fibers
B) Type I fibers
C) Type IIa fibers
D) Intermediate fibers

2. According to the sliding filament theory, which molecule must bind to the myosin head to facilitate the detachment of the cross-bridge from the actin filament?

A) Calcium ions
B) Adenosine triphosphate (ATP)
C) Troponin
D) Tropomyosin

3. In biomechanics, which term describes the angular equivalent of mass, representing an object's resistance to a change in its angular motion?

A) Moment of inertia
B) Torque
C) Angular momentum
D) Centripetal force

4. Which physiological mechanism is primarily responsible for the rapid increase in ventilation observed at the immediate onset of exercise, prior to significant changes in blood gas concentrations?

A) Peripheral chemoreceptor activation
B) Central chemoreceptor activation
C) Feed-forward neural input from motor cortex
D) Increase in core body temperature

5. During a maximal aerobic capacity test, which gas exchange ratio (RER) value typically indicates that the participant has reached their respiratory compensation threshold?

A) 0.70
B) 0.85
C) 1.00
D) 1.15

6. Which psychological construct, defined by Martens et al., refers to the innate, stable predisposition to perceive competitive situations as threatening and to respond with varying degrees of state anxiety?

A) Trait anxiety
B) Self-efficacy
C) Locus of control
D) Cognitive appraisal

7. What is the primary function of the Golgi tendon organ in the neuromuscular system?

A) To detect changes in muscle length
B) To initiate the stretch reflex
C) To inhibit muscle contraction when tension is excessive
D) To facilitate gamma motor neuron activation

8. Which specific metabolic pathway is responsible for the regeneration of ATP during the first 10-15 seconds of high-intensity, explosive movement?

A) Glycolysis
B) Creatine phosphate system
C) Krebs cycle
D) Beta-oxidation