

# Advanced Human Physiology in Sports Science

Sports Science · Practice Test · 20 Questions

---

**1. Which specific muscle fiber type relies predominantly on anaerobic glycolysis for ATP regeneration and exhibits the highest contraction velocity?**

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

**2. During prolonged submaximal exercise, the 'crossover concept' describes the shift in energy substrate utilization from which primary fuel source to another?**

- A) Lipids to Carbohydrates
- B) Carbohydrates to Lipids
- C) Proteins to Carbohydrates
- D) Glucose to Ketones

**3. Which hormone is primarily responsible for the stimulation of erythropoiesis in response to chronic hypoxic training environments?**

- A) Erythropoietin
- B) Cortisol
- C) Aldosterone
- D) Thyroxine

**4. What is the primary physiological mechanism that causes the 'Bohr Effect' in hemoglobin during intense muscular exercise?**

- A) Increased alkaline pH levels
- B) Decreased partial pressure of CO<sub>2</sub>
- C) Increased temperature and CO<sub>2</sub> concentration
- D) Reduced 2,3-BPG binding

**5. The 'SAID' principle in sports science stands for which of the following?**

- A) Specific Adaptation to Imposed Demands
- B) Systemic Aerobic Intensity Development
- C) Standardized Athletic Injury Diagnosis
- D) Structural Alignment in Dynamic movement

**6. Which cardiac parameter represents the volume of blood pumped by the left ventricle per beat, normalized by body surface area?**

- A) Cardiac Output
- B) Ejection Fraction
- C) Stroke Index
- D) Mean Arterial Pressure

**7. What is the primary site of intracellular calcium storage within a skeletal muscle fiber, essential for the excitation-contraction coupling process?**

- A) Mitochondrial matrix
- B) Sarcoplasmic reticulum
- C) T-tubule system
- D) Golgi apparatus

**8. Delayed Onset Muscle Soreness (DOMS) is most accurately associated with which type of muscular contraction?**

- A) Concentric
- B) Isometric
- C) Isokinetic
- D) Eccentric

**9. During intense anaerobic exercise, which enzyme is the primary rate-limiting factor in the glycolysis pathway?**

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

**10. What is the term for the physiological state where a muscle remains in a state of sustained contraction due to rapid, successive neural stimuli?**

- A) Tetanus
- B) Summation
- C) Recruitment
- D) Hypertrophy

**11. In human thermoregulation during exercise, which mechanism accounts for the greatest heat loss when ambient temperature exceeds skin temperature?**

- A) Conduction
- B) Convection
- C) Radiation
- D) Evaporation

**12. Which neurotransmitter is primarily responsible for triggering the release of calcium ions at the neuromuscular junction?**

- A) Dopamine
- B) Acetylcholine
- C) Serotonin
- D) Norepinephrine

**13. What is the physiological role of the Golgi tendon organ in high-tension athletic movements?**

- A) Muscle spindle activation
- B) Inhibition of agonist muscle contraction
- C) Facilitation of explosive force production
- D) Stabilization of the patellar tendon

**14. Which metabolic byproduct is primarily responsible for the inhibition of PFK activity, thereby limiting performance during high-intensity exercise?**

- A) Lactic acid
- B) Hydrogen ions
- C) Inorganic phosphate
- D) Creatine phosphate

**15. What is the primary anatomical structure where gas exchange occurs within the lungs during physical exertion?**

- A) Bronchioles
- B) Alveoli
- C) Trachea
- D) Pleural cavity

**16. Which protein filament serves as the 'thick filament' in the sliding filament theory of muscle contraction?**

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

**17. In cardiac physiology, what does the Frank-Starling mechanism describe?**

- A) Heart rate variability
- B) Stroke volume's relationship to end-diastolic volume
- C) The speed of electrical conduction
- D) Vasodilation during exercise

**18. Which energy system provides the fastest rate of ATP resynthesis but has the lowest total capacity?**

- A) Phosphagen system
- B) Glycolysis
- C) Oxidative phosphorylation
- D) Beta-oxidation

**19. What is the effect of chronic endurance training on the resting heart rate of an athlete?**

- A) Bradycardia
- B) Tachycardia
- C) Arrhythmia
- D) Fibrillation

**20. Which specific region of the brain is the primary integration center for regulating body temperature during exercise?**

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