

# Advanced Human Physiology and Health Theory

Physical Education Theory · Answer Key · 15 Questions

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**1. Which specific physiological process primarily occurs during the 'fast' component of Excess Post-exercise Oxygen Consumption (EPOC)?**

- A) Gluconeogenesis in the liver
- B) Resynthesis of phosphocreatine stores**
- C) Removal of systemic carbon dioxide
- D) Conversion of lactate to amino acids

**2. In biomechanics, which type of lever is most common in the human body, providing speed and range of motion at the expense of force?**

- A) First-class lever
- B) Second-class lever
- C) Third-class lever**
- D) Fourth-class lever

**3. What is the primary function of the Golgi tendon organ within the musculoskeletal system?**

- A) To detect changes in muscle length
- B) To inhibit muscle contraction when tension is excessive**
- C) To facilitate the stretch reflex
- D) To increase the sensitivity of muscle spindles

**4. During prolonged aerobic exercise, which metabolic pathway is primarily responsible for maintaining blood glucose levels when glycogen stores are depleted?**

- A) Glycogenolysis
- B) The Cori cycle
- C) Gluconeogenesis**
- D) Beta-oxidation

**5. Which neurotransmitter is exclusively responsible for the initiation of muscle contraction at the neuromuscular junction?**

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

**6. What is the definition of 'Cardiac Drift' during steady-state exercise?**

**A) A decrease in stroke volume and increase in heart rate**

B) An increase in stroke volume and decrease in heart rate

C) A plateauing of both heart rate and stroke volume

D) A sudden drop in blood pressure

**7. Which muscle fiber type is characterized by high mitochondrial density, high capillary density, and low myosin ATPase activity?**

A) Type IIx

B) Type IIa

**C) Type I**

D) Type IIb

**8. What is the 'Frank-Starling Law' of the heart?**

A) The relationship between blood viscosity and flow

**B) The stroke volume of the heart increases in response to an increase in the volume of blood filling the heart**

C) The rate at which the SA node fires is proportional to autonomic input

D) The force of contraction is independent of end-diastolic volume

**9. Which hormonal response is primarily responsible for the mobilization of free fatty acids from adipose tissue during exercise?**

A) Insulin

**B) Glucagon**

C) Cortisol

D) Aldosterone

**10. The 'Size Principle' of motor unit recruitment dictates that motor units are recruited in which order?**

A) From largest to smallest

B) Randomly based on fatigue levels

**C) From smallest to largest**

D) Based solely on muscle fiber diameter

**11. What is the primary physiological limitation to VO<sub>2</sub> max in healthy, untrained individuals?**

A) Pulmonary diffusion capacity

**B) Maximal cardiac output**

C) Peripheral oxygen extraction

D) Alveolar ventilation rate

**12. Which specific mineral is essential for the binding of troponin to tropomyosin to allow for actin-myosin cross-bridge formation?**

- A) Potassium
- B) Magnesium
- C) Calcium**
- D) Sodium

**13. What defines the 'Ventilatory Threshold' (Tvent) in exercise testing?**

- A) The point where ventilation increases disproportionately to oxygen consumption**
- B) The point where blood pH drops below 7.0
- C) The maximal breath-hold duration
- D) The point of equilibrium between O<sub>2</sub> intake and CO<sub>2</sub> output

**14. In the context of bone remodeling, which cells are responsible for bone resorption?**

- A) Osteoblasts
- B) Osteocytes
- C) Osteoclasts**
- D) Chondrocytes

**15. Which biomechanical factor is primarily responsible for the reduction of joint friction and the distribution of compressive loads?**

- A) Synovial fluid viscosity
- B) Articular cartilage hydration**
- C) Ligamentous tension
- D) Tendon elasticity