

Advanced Human Physiology and Health Theory

Physical Education Theory · Practice Test · 15 Questions

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 VO₂ 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 O₂ intake and CO₂ 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