

Name: _____ Date: _____

Periodization and Biomechanics: 12th Grade Elite Fitness Quiz

Analyze metabolic pathways, mechanical leverage, and macrocycle planning to optimize high-level individual performance and physiological adaptation.

1. An elite cyclist is in the 'Competition Phase' of a macrocycle. Which metabolic adaptation is most critical for maintaining a high power output just below the lactate threshold during a time trial?

- A. Increased mitochondrial biogenesis and capillary density
- B. Rapid depletion of phosphocreatine stores
- C. Downregulation of aerobic enzyme activity
- D. Decreased stroke volume to conserve cardiac energy

2. In biomechanical analysis, the 'law of inertia' implies that a shot putter must exert more force to initiate movement of the implement than to maintain its velocity during the glide.

- A. True
- B. False

3. During the eccentric phase of a heavy deadlift, the primary movers perform _____ contraction to control the descent and manage mechanical tension.

- A. Isometric
- B. Concentric
- C. Isokinetic
- D. Lengthening

4. Applying the Principle of Specificity, which training modality best prepares a competitive rock climber for the isometric demands of 'crux' holds?

- A. High-repetition endurance swimming
- B. Dead-hangs and weighted fingerboard holds
- C. Plyometric box jumps for explosive power
- D. Long-distance trail running for aerobic base

5. Hypertrophy training specifically targets the Type I (slow-twitch) muscle fibers to maximize explosive power and force production.

- A. True
- B. False

6. A marathon runner experiencing 'the wall' at mile 20 is likely suffering from _____, necessitating a shift to lipid metabolism which is less ATP-efficient.

- A. Glycogen depletion
- B. Lactic acid buildup
- C. Oxygen toxicity

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D. Hypertrophic cardiomyopathy

7. When evaluating a springboard diver's rotation speed, which physical adjustment decreases the moment of inertia to increase angular velocity?

- A. Extending the arms out to the sides
- B. Entering a tight tuck position
- C. Arching the back away from the axis
- D. Slowing the initial take-off speed

8. To avoid Overtraining Syndrome during a rigorous strength program, athletes should utilize _____, which involves a strategic reduction in volume before a competition.

- A. Hyper-loading
- B. Cross-training
- C. Tapering
- D. Metabolic conditioning

9. Which of these represents a 'Third Class Lever' system in human movement, common in individual sports like tennis or badminton?

- A. The calf muscle during a heel raise
- B. The neck muscles holding the head upright
- C. The biceps brachii during a forearm curl
- D. The quadriceps during a seated leg extension

10. Proprioceptive Neuromuscular Facilitation (PNF) is a stretching technique that utilizes the Golgi Tendon Organ reflex to inhibit muscle contraction and increase range of motion.

- A. True
- B. False