Name: _____ **Date:** _____

Feeling the Burn: 7th Grade Biomechanics & Muscle Mayhem Quiz

Calculate metabolic shifts and analyze cardiac output to solve high-pressure athletic scenarios using advanced physiological reasoning.

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1. A mountain biker transitions from a flat trail to a 45-degree vertical incline. To maintain power, their Stroke Volume (SV) increases. This is a primary example of which physiological concept?

A. Chronic adaptation of the left ventricle
B. Acute response to increased workload
C. Delayed muscle soreness (DOMS)
D. Excess Post-exercise Oxygen Consumption (EPOC)

2. An athlete training at high altitudes for three months experiences an increase in red blood cell count to transport more oxygen. This long-term change is known as ____.

A. Cardiovascular Drift
B. Thermoregulation
C. Chronic Adaptation
D. Muscle Atrophy

3. The Phosphagen System (ATP-CP) is the primary energy pathway used by a cross-country runner during the steady-state middle miles of a 5K race.

A. True
B. False

4. Why does a 7th-grade student's Tidal Volume (the amount of air moved in/out per breath) increase significantly during a vigorous game of soccer?

A. To decrease the partial pressure of nitrogen in the blood
B. To increase the concentration of lactic acid in the lungs
C. To facilitate gas exchange and remove excess carbon dioxide
D. To reduce the heart rate through the Valsalva maneuver

5. During a heavy lifting session, 'Microtrauma' occurs in the sarcomeres. The process involving protein synthesis that builds the muscle back stronger is called ____.

A. Hypertrophy
B. Glycolysis
C. Vasoconstriction
D. Capillarization

6. Venous Return, the rate of blood flow back to the heart, is generally higher when a person is performing active recovery (walking) than when they sit down immediately after a sprint.

A. True

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B. False

7. If an athlete's VO2 Max (maximum oxygen uptake) increases after a year of swimming, what has fundamentally changed in their physiology?

A. They have switched exclusively to Anaerobic metabolism
B. Their body has become more efficient at delivering and using oxygen
C. Their maximum heart rate has increased by 50 beats per minute
D. Their skeletal bones have become more porous to allow air flow

8. As body temperature rises during a basketball game, vessels near the skin widen to release heat. This physiological process is known as ____.

A. Vasodilation
B. Oxidation
C. Hemoglobin
D. Homeostasis

9. Which energy system would be primarily responsible for a gymnast performing a 30-second high-intensity floor routine involving explosive tumbling passes?

A. Aerobic Lipolysis
B. Slow Glycolysis
C. Anaerobic Lactic (Fast Glycolytic)
D. Photosynthetic system

10. Mitochondria density increases in muscle cells as a chronic adaptation to regular endurance training, such as long-distance cycling.

A. True
B. False