

PHYSIOLOGY 452/552  
CARDIOVASCULAR EXAMINATION  
VERSION 1  
Thursday April 25<sup>th</sup>, 2013

**INSTRUCTIONS:**

This examination consists of 35 questions, 8 pages (including this cover page). Please check that your copy has all pages.

Print your name and 8-digit UB person number on the answer sheet.

Mark your answers carefully on the answer sheet with a #2 pencil. If you erase, do so completely.

You may keep the examination.

Answers will be posted as soon as possible on UBLearns.

**WE DO NOT ANSWER QUESTIONS DURING THE EXAMINATION.**

We need to see your UB ID card.

If you have forgotten your card, please bring it to the Department Office (124 Sherman) within 24 hours.

**TO PREVENT CHEATING ON EXAMS:**

Keep your answer sheet covered.

Please inform one of the instructors if you suspect someone is cheating; (your comments will be kept confidential).

Turn off all cell phones. Anyone who answers a cell phone during the exam will receive a zero (0) for the exam.

**DEPARTMENTAL POLICY ON TEST VERSION NUMBER:**

On side two of your answer sheet (Scantron) there is a "Grade or Education" box below the "Identification box" where you add your student number. In this box, fill in the appropriate version number. If you do not add your exam version you will receive a zero (0) for this exam. If you fill in the WRONG number, you will be scored for the number you fill in. This is your responsibility. If you fill in the wrong number, it cannot be changed after you turn in your exam.

1. A Sarcomere is:

- A. A basic contractile unit in smooth muscle.
- B. A Large multi-nucleated array of myofibrils; essentially one large fused cell.
- C. Equivalent to the cell membrane which covers the entire fiber.
- D. A specialized form of the endoplasmic reticulum adapted for calcium uptake and release.
- E. None of the above.

2. The Sarcoplasmic Reticulum is:

- A. The basic contractile unit in skeletal muscle.
- B. Equivalent to the cell membrane which covers the entire fiber.
- C. A highly organized array of contractile units.
- D. A specialized intracellular structure that stores calcium.
- E. None of the above.

3. Thick Filaments contain:

- A. Actin.
- B. Troponin.
- C. Tropomyosin.
- D. Myosin Kinase.
- E. All of the above.

4. Thin Filaments **do not** contain:

- A. Actin.
- B. Troponin.
- C. Tropomyosin.
- D. Myosin.
- E. None of the above.

5. Cardiac Muscle Contraction is controlled by:

- A. Potassium.
- B. Calcium.
- C. Myosin Kinase.
- D. T-tubules.
- E. All of the above.

6. Skeletal Muscle Contraction signaling is not regulated by:
- A. Frequency of stimulation.
  - B. Calcium Release from the Sarcoplasmic Reticulum.
  - C. Dihydropyridine Receptors.
  - D. Ryanodine Receptors.
  - E. Myosin light chain kinase.
7. Smooth muscle contraction involves:
- A. Actin.
  - B. Terminal cisternae.
  - C. Laplace's equation.
  - D. All of the above.
  - E. None of the above.
8. Which of the following is not true about the resting Cardiac membrane potential?
- A. The membrane resting potential is equal to the Nernst potential for potassium.
  - B. The membrane resting potential has a low sodium conductance.
  - C. Balanced current flow gives rise to the resting membrane potential.
  - D. Pumps and exchangers maintain the background electrical gradients.
  - E. The Nernst potential for sodium is not equal to the resting membrane potential.
9. Which of the following is not true about action potentials?
- A. Action potentials arise from electron flow through membrane capacitance.
  - B. Current is carried by charged ions in solution.
  - C. Action potentials fire in an all-or-none fashion.
  - D. Potassium drives repolarization.
  - E. Chloride is at lower concentrations on the intracellular side of the membrane.
10. During the early phases (upstroke) of the action potential of fast myocardium (e.g. ventricle) which is not true of the sodium channel?
- A. It is completely inactivated.
  - B. It conducts inward current.
  - C. The fastest gates open the channel in response to a depolarization.
  - D. A slower gate shuts the open channel down in response to sustained depolarization.
  - E. It fires transiently.