APPH 4600/6600 Exam 2 2013 Name:_____

Section 1: 10 pt each

1. Sketch a force-length curve and use the sliding filament theory to explain the different regions.

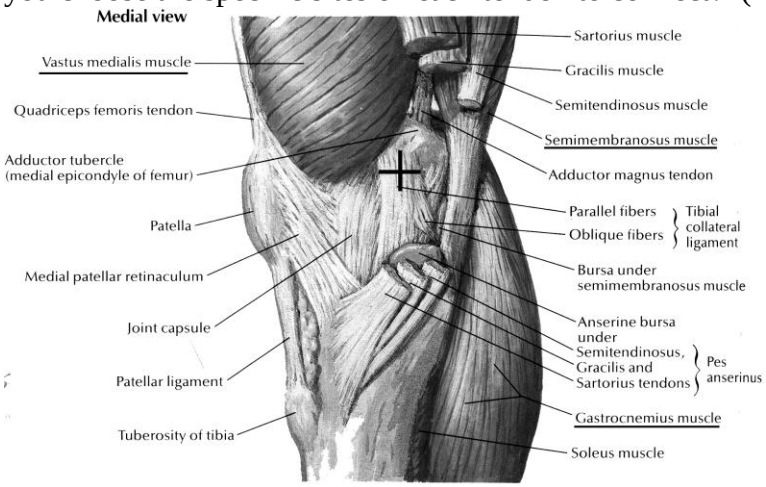
2. Sketch a force-velocity curve and use the crossbridge theory to explain the decline in force.

3. Outline the steps of the crossbridge cycle, being sure to identify the stages of ATP hydrolysis.

4. Outline the key events of excitation-contraction coupling, being sure to identify major channels and calcium-binding molecules.

5. Sketch a sarcomere, identify significant structures, and name the major molecular components.

6. In the figure below, draw lines representing the moment arms of Vastus Medialis, Semimembranosus and Gastrocnemius. The "+" represents the center of knee rotation. How did you choose the specific sites on each tendon to connect? (image from Netter, 1989)



Section 2: 5 pt each

7. The force-length and force-velocity relationships were known before Hill's 3-element model. What does the 3-element model add to our understanding of muscle function?

8. Compare and contrast RyR1 found in skeletal muscle and RyR2 found in cardiac muscle.

9. What is an afterloaded contraction, and what does it have to do with study of muscle function?

10. This question has been snowed out.

11. .Give three cellular specializations that improve resistance to fatigue.

12. Sketch the temporal response of each part of the 3-element model to a step change in muscle length.

13. What is the Size Principle?

14. How does mass action contribute to the rate of fatty acid metabolism during physical activity?