Unit One Homework
C11 Skeletal Muscle

Muscle Contractions (1:25 min)
1. What activates the skeletal muscle?
2. What do we call the signal sent down the motor neuron towards the muscle fiber?
3. What is the union of the motor neuron's terminal ends with the muscle fiber (skeletal muscle cells)?
4. What is the neurotransmitter released from the terminal end of the nerve fiber?
5. What is the space called between the terminal end of the nerve and the muscle fiber?
6. What ion enters the muscle fiber after the neurotransmitter docks to the chemically gated ion channel?
7. What will be initiated on the surface of the muscle fiber?
8. What happens after the muscle is activated?

The Myofilament (1:25 min)
1. What molecules make the myofilaments?
2. How is the actin filament formed?
3. How is the myosin filament formed?
4. What causes a muscle to contract?
5. When does contraction begin?
6. What causes the myosin head to release actin and recoil? Then what happens?

Neuromuscular Junction (1:25 min)
1. Where does the action potential stop? What does the action potential initiate?
2. What is located on the post synaptic membrane? What binds to this object? Causing what to happen?
3. What happens to the post synaptic membrane?
4. What must happen before post synaptic action potential is propagated over the surface of the muscle fiber?
5. What occurs in the synaptic cleft after threshold is achieved?

Sliding Filament Theory - Muscle Contraction (1:25 min)
1. What ion binds to troponin? Causing what?
2. What is exposed after the ion binds to troponin?
3. What is attached to the myosin head from the previous cycle?
4. What term describes the attachment of the myosin head to the actin? What occurs?
5. When is the bond between actin and myosin broken?
6. What allows this cycle to continue?

Myosin Heads Interacting With Actin (40 sec)
1. When does myosin cross linking occurs?
2. What occurs when the cross link forms?

Myosin Heads and Actin Filaments (2:25 min)
1. What ion is present around the actin and myosin filaments?
2. What occurs when "new" ATP is present?
3. What causes relaxation?

Sliding Filament Theory (7 min)

1. What is one motor unit?
2. What is the motor end plate?
3. What is the synaptic cleft?
4. What is excitation contraction coupling?
5. What occurs after action potential is created at the NMJ?
6. What happens after calcium is released?
7. What must form before contraction occurs?
8. What is the sliding filament theory?
9. What changes in muslce during contraction?
10. When is a muscle relaxed?
11. What is the role of calcium in contraction mechanisms?
12 What sequence of events occur during relaxation?
13. Where does the energy used to power the interaction between myosin and actin come from?
14. After ATP is formed, how long does it last in the muscle?
15.. What three pathways produce ATP?
16. How long will creatinine phosphate be able to power skeletal muscle contractions?
17. What is muscle fatigue?
18. What is oxygen debt?
19. How much energy during a muscle contraction is lost as heat?

Stretch Reflex & Muscle Spindle (34 min)

1. What are the two type of fibers (cells) in the structure of a skeletal muscle?
2. What type of fiber is responsible for the force a muscle generates? Two important features?
3. What are the fibers called in the connective tissue capsules located among the extrafusal fibers? Significance? Function?
4. What term is used to describe the connective tissue capsule?
5. What are the muscle spindles measuring?

Note: you may skip from the 13:12 min and resume watching the video at the 18:24 min

6. What is a deep muscle reflex responding to?
7. What type of neuron carries the type 1alfa and type 2alfa fibers? To where?
8. What does the sensory neuron synapse to? Why is it called a monosynaptic reflex?
9. What is the function of the inter-neuron in this presentation?
10. What is the function of the gamma motor neurons?
11. What is another name for a corticospinal tract?
12. What do upper motor neurons synapse on? To do what?
13. What happens if you have a lesion between the upper motor neuron and gamma morotr neuron?