**Exam 1 Part D. Your Name:**

**Please TYPE your answers in an MS Word Document. When complete send your exam answers as an ATTACHMENT to an Email to Dr. Kravitz. Exam 1 Part D is due Friday February 12 by 12midnight. No late papers accepted. Also, academic honesty is totally active here. Please do your OWN work! Use AS MUCH SPACE as you wish in your answers!**

*This EXAM is open note. Please use the WEB LINK to guide your answers.*

**A. Please answer the following questions. (3 pts each for a total of 54 pts )**

1. What researchers are recognized with explaining the action potential?

2. What part of the motor neuron receives sensory stimuli?
3. What part of the motor neuron processes incoming stimuli to determine whether to send an excitatory or inhibitory message?
4. The axon is surrounded by an insulation referred to as the\_\_\_\_\_\_\_ ?
5. The myelin sheath is made of \_\_\_\_\_\_\_\_\_\_cells?
6. The propagation (or spread) of the action potential is referred to as a \_\_\_\_\_\_\_\_\_\_\_\_ conduction?
7. How fast is the propagation of the nerve impulse along the axon?
8. What ion is predominantly intracellular at RMP (rest)?
9. What ion is predominantly extracellular at RMP (rest)?
10. A graded potential that is more negative at RMP (rest) is called a \_\_\_\_\_\_\_\_\_\_\_\_?
11. A graded potential that is more positive at RMP (rest) is called a \_\_\_\_\_\_\_\_\_\_\_\_?
12. Threshold for a nerve is met at what mV \_\_\_\_\_\_\_\_\_\_\_\_?
13. A nerve that has met threshold will spike to what mV \_\_\_\_\_\_\_\_\_\_\_\_?

14. The Na+K+ pump does it’s work by Active Transport. This means the pump requires\_\_\_\_\_\_\_?

15. What medical doctor discovered animal electricity which he called bioelectricity?

16. What enzyme repackages the acetylcholine back into the synaptic vesicles (abbreviation is O.K.)?

17. At the axon terminal, calcium rushes in after an action potential and reacts with what protein on the synaptic vesicles?

18. What ion channel on the motor endplate is a ligand-gated ion channel?

**B. Please draw and write in detail the 5 steps of an action potential as we did on the Youtube video. Please take a PICTURE of your Action Potential diagram and input into the MS Word document or attach to your email. (40 pts)**

**C. In your own words, explain how the Na+K+ pump restores the sodium and potassium ions, which helps to take the RMP of the cell to -70mV. (15 pts)**

**D. In your own words, from watching the Youtube video, explain how the Nodes of Ranvier work to propagate the action potential from Node to Node of Ranvier. (20 pts)**

**E. The sequential events from the arrival of the action potential to the skeletal muscle contraction placed out of order. Please place them in correct order. I have started for you. (39 pts)**

\_\_\_\_Calcium ions released from SR

\_\_\_\_Calcium ions rush in and react with synapsin on synaptic vesicles

\_\_\_\_Myosin (S1 units) combine with actin

\_\_\_\_With ATP present, ATPase splits ATP to ADP + Pi + Energy

\_\_\_\_Tropomyosin returns over active sites on actin and contraction ceases

\_\_\_\_Impulse travels T- tubules & excites sarcoplasmic reticulum (SR)

1)\_\_\_\_Motor nerve’s impulse action potential arrives at axon terminal of the neuromuscular junction

\_\_\_\_Shift of tropomyosin, make sites available for myosin

\_\_\_\_Acetylcholine released via process of exocytosis

\_\_\_\_Calcium binds with troponin

\_\_\_\_Sliding action of actin over myosin (Power Stroke)

\_\_\_\_Acetylcholine binds with receptor sites on motor end plate causing depolarization of motor end plate and sarcolemma (AChE repackages ACh back into synaptic vesicles)

\_\_\_\_Impulse stops to muscle: calcium ions pumped back into sarcoplasmic reticulum (SR)

\_\_\_\_Synaptic vesicles fuse with cell membrane

**F. In your own words, explain the hypertrophic factors from resistance training? Also explain what factor is considered debatable in humans? (10 pts)**

**F. In your own words, explain the three factors of neural drive? (10 pts)**

**G. From the science in the classroom lecture on Youtube, what is the proposed explanation how eccentric actions can produce 40% more force than concentric or isometric actions? (8 pts)**

**END**