QUIZ 2 Bio350 Feb. 8, 2018- Cooper **PRINT YOUR NAME**_____

1. **A single quantum of response measured in a postsynaptic cell refers to a .....**

A) summated electrical response due to many vesicles being released from the presynaptic neuron.

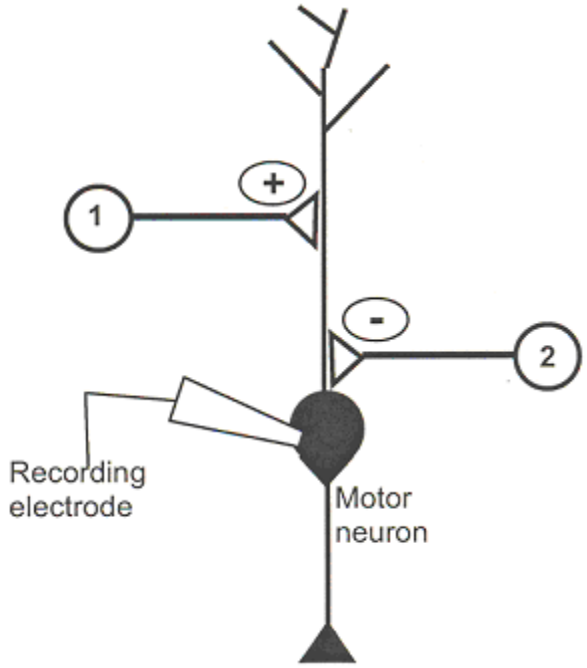
B) a measure of current needed to elicit an action potential.

C) The amount of electrical response to hyperpolarize a cell below its resting membrane potential

D) The response measured in a postsynaptic cell due to the fusion of a single vesicle in the presynaptic cell.

E) none of the above

2. **A motor neuron receives sensory input from two different neurons, #1 and #2. Stimulation of sensory neuron #1 results in an EPSP of 50 mV more positive than the resting potential. An equivalent stimulation of sensory neuron #2 results in an IPSP of –40 mV below, or more negative than, the resting potential. The threshold for firing an action potential (at the base of the axon) in the motor neuron is 30 mV more positive than the resting potential. If an equivalent stimulus is given to the two sensory neurons at about the same time, the motor neuron is likely to:**



A. hyperpolarize relative to resting potential.
B. not change its membrane potential.
C. depolarize relative to rest but not fire an action potential.
D. reach threshold, but not fire an action potential.
E. fire an action potential.
+50-40=only +10 mV but need 30 mV to research threshold

3. **An isolated nerve muscle preparation treated with a moderate dose of curare would be associated with a decrease in the (NOTE: there could be more than one correct answer. Circle all that are correct.)**

Curare I mentioned in class blocks the Ach receptors at neuromuscular junction in mammals so…….

A. Frequency of MEPPs
B. Amplitude of MEPPs (spontaneous quantal synaptic events)
C. Release of transmitter from the terminal of the motor axon triggered by a presynaptic action potential
D. Amplitude of the EPP (evoked synaptic response)

4. **An isolated nerve muscle preparation exposed to a low concentration of extracellular Ca2+ would be associated with a decrease in the (NOTE: there could be more than one correct answer of i-iv).**
(i). Amplitude of the EPP…… due to fewer vesicles fusing
(ii). Release of transmitter from the terminal of the motor axon triggered by a presynaptic action potential …… due to fewer vesicles fusing
(iii). Influx of Ca2+ into the presynaptic terminal….. decreased driving gradient with reduced Ca2+
(iv). Amplitude of MEPPs …. Not related

A. i and iii
B. i and ii
C. i and ii and iii
D. i and ii and iii and iv
E. only i

5. (2 points) In humans a demylenating disease can cause many problems with regulation of muscle coordination. Why is it that the early onset of the disease there is not so many problems but as the disease progresses skeletal muscle control becomes worse and sensory input is lost in some cases. (Please explain the detail of the problem at the cell level or surrounding cell environment and why the problems come about)

The insulation around the neurons is being lost and it is progressively getting worse….. the neurons will impact each other and start to short curcit each other or have some impact on each other. (So think what if you took the insulation off the wire to a lamp in your apt/home and crossed the two wires inside. So in case you do not know there are two wires inside …..think what would happen if you took a paper clip and opened it up and stuck one end in the wall outlet and the other end in the other part of the outlet (not the ground port) ?)

The myelination keeps the capacitance lower so electrical signal can travel quickly along neurons …the more loss the slower electrical signals will become…..

These two points are the main ideas to get across for now.

6. . In the complete metabolism of one glucose molecule, in the presence of oxygen, most ATP molecules are produced in which one of the following series of reactions or cycles listed

A) Citric-acid cycle & ETC (electron transport chain) …..

B) Glycolysis

C) The steps of 'A' and 'B' above both produce the same amount of ATP therefore they are equal

7. (2 points) How to test and understand whether a synapse between two neurons is electrical or chemical? You might described an experiment to test. Be sure to state what is expected for either a chemical or electrical transmission in your experiment or conditions you use.

There are so many ways…….

a. temp….. cold will slow down protein conformational changes so all those process which go into chemical synaptic transmission would be slowed….as compared to electrical gap junctions where are is not all the processes.. SO LIST OUT VARIOUS STEPS INVOLVED IN CHEMICAL SYNAPTIC TRANSMISSION

b. Lower extracellular Ca2+ ….this will reduced chemical synaptic transmission but not electrical

c. block voltage gated Ca2+ channels…. Cd2+, Mg2+…… this will reduced chemical synaptic transmission but not electrical

d. Experiments also might be to use intracellular electrodes in the two cells and pass negative as well as positive current bother directions and see what the target cells response is like….. Chemical will not be matching a – and + currents across gap junctions as for electrical synapses.

8. **. (1 point) What is the August Krogh principle ?**

Google it

https://en.wikipedia.org/wiki/Krogh%27s_principle