1) 10 Points: Refer to diagram. Some answers are used more than once. (There are 10 correct answers; -1 for each answer over 10.)

_____ a. pt where the concentration and electrical gradients for Na⁺ are opposed.
_____ b. where the concentration and electrical gradients for K⁺ are in the same direction
_____ c. pt where most voltage-dependent sodium and potassium channels are closed.
_____ d. membrane leak channels are open.
_____ g. closest to the reversal potential for most ligand-gated nonspecific cation channels.
_____ h. point where the driving forces on Na⁺ and K⁺ are opposed and depend only on the concentration gradient.

One Point Each Question/Circle One Correct Answer Only for Each Question

2) At the peak of the action potential:

a. Most sodium channels are in the inactivated conformation.
b. A few voltage-dependent potassium channels have opened.
c. The sodium current is equal and opposite to the potassium current.
d. b. and c. above.
e. All of the above.
3) If sodium channels did not inactivate:
   a. More energy would be expended in active propagation.
   b. It would be impossible to repolarize the membrane.
   c. Active propagation would be more rapid.
   d. All of the above.
   e. a. and b. above.
   f. b. and c. above.

6) Some forms of Long QT Syndrome are dominant-negative mutations because:
   A. All channels are nonfunctional.
   B. The mutant potassium channel gene suppresses the genetic expression of the wild-type (normal) potassium channel subunit.
   C. Mutant potassium channel subunits form heteromultimers with wild-type subunits, and all or some of these heteromultimers are nonfunctional.
   D. The mutant potassium channel shortens the duration of the cardiac action potential.
   E. All of the above.