The Cardiovascular System: Cardiac Action Potential

1. How do the waves of depolarization, generated by the autorhythmic cells spread to the muscle cells?

2. Depolarizing current from the autorhythmic cells causes the ventricular muscle cells to ________.

3. Name the 3 channels essential for generating an action potential and indicate which way the ions move (circle the correct one):
   a. ___________ channels     into  or  out of
   b. ___________ channels     into  or  out of
   c. ___________ channels    into  or  out of

4. If the sodium channel or the fast calcium channels are open, the inside of the cell would be relatively more ________.

5. The pacemaker potential is due to a/an (decreased or increased) efflux of ____ ions compared to a normal influx of ____ ions.

6. Threshold for the action potential in the SA Node is at ____ mV. What channels open, causing depolarization? ________________

7. The reversal of membrane potential causes the _____ channels to open, causing the ________________ of the membrane.

8. The ___________ pumps sodium out and potassium into the cell, restoring ion concentrations to their resting levels.

9. Where is calcium stored in the contractile cells? ________________

10. Gap junctions allow what cations to pass into the cardiac contractile cells, causing the opening of voltage-gated sodium channels? ________________

11. State the voltage-gated channels responsible for the following stages of the action potential in cardiac contractile cells:
   a. Depolarization ________________
   b. Plateau ________________
c. Repolarization ______________________

12. What channels in the autorhythmic cells allow ions to leak in, producing a pacemaker potential? (Quiz section) ______________

13. What channels in the autorhythmic cells bring about depolarization? ____________.