



Sample Questions

Multiple Choice Questions

Indicate whether the following physiological event represents

- (a) intrinsic control
 - (b) negative feedback control
 - (c) positive feedback control
 - (d) feedforward control
1. _____ increased blood flow into muscle tissue in response to a localized increase in carbon dioxide
 2. _____ the release of a hormone to lower blood calcium levels when it gets too high
 3. _____ increased cardiac activity to elevate blood pressure when systemic pressure is low
 4. _____ rapid clotting of blood due to increasing levels of platelet activity at a site of vessel damage
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5. When a membrane is stimulated due to opening of chemically-gated Na^+ channels
 - (a) an impulse is propagated.
 - (b) a graded potential is established.
 - (c) an action potential is established.
 - (d) the voltage becomes more negative.
 - (e) the voltage stays the same.
 6. Which of the following statements concerning myopia is correct?
 - (a) the curvature of the lens is uneven.
 - (b) a near source of light is focused on the retina without accommodation.
 - (c) a convex lens is used to correct the condition.
 - (d) the images from the two eyes are not fused within the cortex.
 - (e) there is increased intraocular pressure.
 7. The sympathetic nervous system
 - (a) is part of the somatic nervous system.
 - (b) has cholinergic preganglionic and adrenergic postganglionic fibers.
 - (c) originates in the thoracic and lumbar regions of the spinal cord.
 - (d) Both (b) and (c) above.
 - (e) All of these answers.
 8. Z lines
 - (a) are formed by the T tubules.
 - (b) extend down the middle of the I band.
 - (c) are formed by the cross bridges.
 - (d) are the thin filaments.
 - (e) extend down the middle of the sarcomere.

Short Answer Questions

9. Glial cells have many roles to play in the nervous system. Briefly describe some (4) of the functions of glial cells. Which glial cell is found only in the PNS?
10. How is the molecular structure of voltage-dependent K^+ ion channels different than for voltage-dependent Na^+ channels? What possibilities does this allow for the voltage-dependent K^+ channels that is not possible with the voltage-dependent Na^+ channels?



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11. For a neuronal cell body at 25°C you find that $[K^+]_{out} = 20\text{mM}$, $[K^+]_{in} = 400\text{mM}$, $[Na^+]_{in} = 50\text{mM}$, $[Na^+]_{out} = 440\text{mM}$, $[Cl^-]_{out} = 540\text{mM}$ and $[Cl^-]_{in} = 60\text{mM}$. You then estimate the permeabilities at PK = 1.0 $P_{Na} = 0.13$, $P_{Cl} = 0.4$. Show work for partial credit.
- (a) Compute the equilibrium potential for each ion.
 - (b) What is the resting potential for this neuron?
 - (c) Which ion is closest to being at equilibrium? Give a plausible explanation why this is so.
12. What is meant by the term somatosensory map? What are some general principles about that map (list two at least)