

## Nervous System Concept Questions

1. Describe the advantage of a reflex response to an organism.
2. How does the nerve impulse cross the space between two nerve cells?
3. You accidentally touch a hot iron. Your hand quickly moves away from the iron. What type of reaction is this? Do you feel pain before you pull your hand away? Explain. Describe what happens in the central nervous system to allow you to react so quickly.
4. Which part of the nervous system is involved in each of the following?
  - a) throwing a ball
  - b) releasing bicarbonate from the pancreas
  - c) falling asleep
  - d) increasing your breathing rate slightly
  - e) running away from a vampire
5. Pain receptors are far more abundant in the skin than are cold receptors. Explain why this is adaptive for survival.
6. Suppose that your skin was not sensitive to pressure or pain. What might happen to the muscles and internal organs beneath the skin?
7. What causes the resting neuron to be polarized?
8. Describe the distribution of ions across the cell membrane as it changes from a resting potential to an action potential and then into refractory period?
9. How is the membrane potential of the resting cell restored after a nerve impulse has passed?
10. Imagine you cut yourself and some nerves are severed. What effect would this have on the transmission of impulses?
11. If a person's spinal cord was crushed at the neck, resulting in paralysis, what parts of the body would be affected? What would the effect be?
12. What are the advantages of myelinated nerve axons? How does this explain the symptoms of MS?
13. a) What is the all-or-none response?
  - b) If a stimulus causes an all-or-none response, how can the level of pain you feel vary?
14. Use the idea of threshold levels to explain why some individuals can tolerate more pain than others.
20. Draw a fully-labelled graph showing the potential of the neural membrane as it fires.
15. Explain the functions of acetylcholine and cholinesterase in the transmission of nerve impulses.
16. Use the idea of a synapse to explain why a nerve impulse can move from neuron A to neuron B but not *vice versa*.
17. Use the idea of a synapse and neurotransmitters to explain the concept of summation.
18. How can drugs act as stimulants or depressants?
19. What is an endorphin? How does it work?
20. Tetrodotoxin is a toxin present in the spines of the puffer fish. It has the capability of blocking the function of voltage-regulated sodium channels. What effect do you suppose this substance would have on the formation of nerve impulses? What effect would this have on the contractions of muscles?