

1. All of the following are parenteral routes of drug administration EXCEPT the \_\_\_\_ route.
  - A) oral
  - B) inhalation
  - C) injection
  - D) topical
  - E) transdermal
  
2. The \_\_\_\_\_ effect occurs when drugs are initially transported to the liver where a significant amount of the drug may be metabolized and destroyed before the drug reaches its primary site of action.
  - A) malabsorptive
  - B) first-pass
  - C) Bohr
  - D) bioequivalence
  - E) pharmacodynamic
  
3. Iontophoresis, phonophoresis, and medicated patches all use the \_\_\_\_\_ route to administer drugs.
  - A) oral
  - B) inhalation
  - C) injection
  - D) transdermal
  - E) rectal
  
4. This first-pass effect is of particular concern when drugs are administered:
  - A) topically.
  - B) intravenously.
  - C) subcutaneously.
  - D) by inhalation.
  - E) orally.
  
5. The extent to which a drug reaches the systemic circulation is referred to as:
  - A) bioequivalence.
  - B) biotransformation.
  - C) bioavailability.
  - D) biodistribution.
  - E) last-pass metabolism.
  
6. When crossing cell membranes, drugs will diffuse more readily through the lipid layer if they are:
  - A) nonlipid soluble.
  - B) in a neutral, nonionized form.
  - C) in a charged, ionized form.
  - D) large proteins.
  - E) none of the above

7. Osmosis refers to the special case of diffusion where the diffusing substance is:
- A) a lipid-soluble drug.
  - B) a nonlipid-soluble drug.
  - C) a protein.
  - D) a carbohydrate.
  - E) water.
8. Carrier specificity, expenditure of energy, and ability to transport substances against a concentration gradient are all characteristics of:
- A) simple, passive diffusion.
  - B) facilitated diffusion.
  - C) active transport.
  - D) endocytosis.
  - E) exocytosis.
9. A drug that has a volume of distribution of approximately 42 L will typically be:
- A) bound extensively to plasma proteins.
  - B) retained in the bloodstream.
  - C) concentrated in the tissues.
  - D) stored in the liver and kidneys.
  - E) uniformly distributed throughout all of the body fluids.
10. The primary site for drug storage in the body is:
- A) muscle.
  - B) bone.
  - C) skin.
  - D) adipose tissue.
  - E) the brain.

**Answer Key**

1. A
2. B
3. D
4. E
5. C
6. B
7. E
8. C
9. E
10. D