



## Chapter 38 Exercises

### Review Questions

- When dehydrated human patients need to be given fluids intravenously, they are given \_\_\_\_\_.
  - water, which is hypotonic with respect to body fluids
  - saline at a concentration that is isotonic with respect to body fluids
  - glucose because it is a nonelectrolyte
  - blood
- The sodium ion is at the highest concentration in \_\_\_\_\_.
  - intracellular fluid
  - extracellular fluid
  - blood plasma
  - none of these
- Cells in a hypertonic solution tend to \_\_\_\_\_.
  - shrink due to water loss
  - swell due to water gain
  - stay the same size due to water moving into and out of the cell at the same rate
  - none of these
- The macula densa is/are \_\_\_\_\_.
  - present in the renal medulla
  - dense tissue present in the outer layer of the kidney
  - cells present in the DCT and collecting tubules
  - present in blood capillaries
- The osmolarity of body fluids is maintained at \_\_\_\_\_.
  - 100 mOsm
  - 300 mOsm
  - 1,000 mOsm
  - It is not constantly maintained.
- The gland located at the top of the kidney is the \_\_\_\_\_ gland.
  - adrenal
  - pituitary
  - thyroid
  - thymus
- Active transport of  $K^+$  in Malpighian tubules ensures that \_\_\_\_\_.
  - water follows  $K^+$  to make urine
  - osmotic balance is maintained between waste matter and bodily fluids
  - both a. and b.
  - neither a. nor b.
- Contractile vacuoles in microorganisms \_\_\_\_\_.
  - exclusively perform an excretory function
  - can perform many functions, one of which is excretion of metabolic wastes
  - originate from the cell membrane
  - both b. and c.
- Flame cells are primitive excretory organs found in \_\_\_\_\_.
  - arthropods
  - annelids
  - mammals
  - flatworms
- BUN is \_\_\_\_\_.
  - blood urea nitrogen
  - blood uric acid nitrogen
  - an indicator of blood volume
  - an indicator of blood pressure
- Human beings accumulate \_\_\_\_\_ before excreting nitrogenous waste.
  - nitrogen
  - ammonia
  - urea
  - uric acid

12. Renin is made by \_\_\_\_\_.
- a. granular cells of the juxtaglomerular apparatus
  - b. the kidneys
  - c. the nephrons
  - d. all of these
13. Patients with Addison's disease \_\_\_\_\_.
- a. retain water
  - b. retain salts
  - c. lose salts and water
  - d. have too much aldosterone
14. Which hormone elicits the "fight-or-flight" response?
- a. epinephrine
  - b. mineralocorticoids
  - c. antidiuretic hormone
  - d. thyroxine

### Critical Thinking Questions

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15. Why is excretion important in order to achieve osmotic balance?
16. Why do electrolyte ions move across membranes by active transport?
17. Why are the loop of Henle and vasa recta important for the formation of concentrated urine?
18. Describe the structure of the kidney.
19. Why might specialized organs have evolved for excretion of wastes?
20. Explain two different excretory systems other than the kidneys.
21. In terms of evolution, why might the urea cycle have evolved in organisms?
22. Compare and contrast the formation of urea and uric acid.
23. Describe how hormones regulate blood pressure, blood volume, and kidney function.
24. How does the renin-angiotensin-aldosterone system function? Why is it controlled by the kidneys?