**Osmoregulation and Excretory Revision Questions:**

1. Define the term osmoregulation. From what you have learned in cell biology, why would it be important for living things to be able to osmoregulate their bodies?
2. What is a nitrogenous waste? How does it form? What does the body do with it?
3. What kinds of organisms excrete ammonia? What environmental factors determine this? Why not urea or uric acid?
4. What kinds of organisms excrete urea? What environmental factors determine this? Why not ammonia or uric acid?
5. What kinds of organisms excrete uric acid? What environmental factors determine this? Why not urea or uric acid?
6. Define the terms osmoconformer and osmoregulator by including the terms hyperosmotic, hypoosmotic, and isoosmotic.
7. Which of the above takes energy? Why?
8. Compare and contrast the osmoregulatory problems and adaptations of
   1. a marine bony fish with a freshwater bony fish
   2. an earthworm with an insect.
9. What are the evolutionary adaptations that are required by land animals to conserve water? Why is conserving water so important on a cellular level?
10. Draw the macroscopic organs of the excretory system of vertebrates. Include in your drawing: kidneys, renal artery and vein, renal hilus, renal pelvis, cortex, medulla, ureters, bladder, urethrea.
11. Draw microscopic functional unit of the kidney called the nephron: Include in your drawing the following structures: glomerulus, renal corpuscle, bowman’s space, bowman’s capsule, proximal convoluted tubule, loop of henle, distal convoluted tubule, collecting duct, afferent arteriole, efferent arteriole.
12. Define the following terms:
    1. filtration
    2. Tubular secretion
    3. Tubular reabsorbtion
13. Explain the following:
    1. how and where filtrate is created
    2. how is filtrate different than blood
    3. why human urine has ammonia in it
14. Explain a) which way each of the following substances moves (blood to filtrate or filtrate to blood) and b) why.
    1. drugs
    2. HCO3-
    3. Glucose
    4. NaCl
    5. water
    6. H+
    7. urea
15. Why does the solute concentration of the filtrate increase as it passes down the loop of henle?
16. By what mechanism does the filtrate become more concentrated than the intersticial fluid? Where does this process take place?
17. What is the advantage of being able to excrete a concentrated waste?