The Urinary System: Anatomy Review

1. Name the organs in the urinary system:
   1. ____________________
   2. ____________________
   3. ____________________
   4. ____________________

2. The kidneys are _____________________ (behind the peritoneum) lying against the dorsal body wall in the upper abdomen.

3. The _____________ gland sits atop the kidneys. Blood vessels enter and leave the kidney at the renal ____________.

4. The functional units of the kidney are the _______________. They are called _______________ ____________ if they are located mainly in the cortex. They are called _______________ ____________ if they are located in both the cortex and medulla.

5. Blood enters the kidney through the _____________ artery. The artery branches into smaller and smaller arteries and arterioles. Complete the sequence below:
   _______________ arteriole → _______________ capillaries → _______________ arteriole → _______________ capillaries and vasa recta

6. Complete the sequence below showing all parts of the nephron:
   Bowman’s Capsule → _______________ convoluted tubule → _______________ (both descending and ascending limb) → _______________ convoluted tubule → _______________ (both cortical and medullary sections)

7. The renal corpuscle consists of two parts: _______________ capillaries and ________________________________. A portion of the plasma is filtered into the capsular space due to the hydrostatic pressure of the blood.

8. The filtration membrane consists of:
9. **Proximal tubule**: The simple cuboidal cells of the proximal tubule are called _______________ cells because they contain numerous microvilli. The microvilli increase the _______________ for reabsorption.

The proximal tubule cells are highly permeable to water and many solutes. The _______________ permit the movement of water between the cells.

10. **Loop of Henle**: The thin descending limb of the loop of Henle is highly permeable to _______________ but not to _______________.

The thick ascending limb of the loop of Henle is highly permeable to _______________ but not to _______________.

11. The thick ascending limb of the loop of Henle runs back between the afferent and efferent arterioles as they enter and leave Bowman’s capsule. The juxtaglomerular apparatus consists of the _______________ cells of the tubule and the _______________ (modified smooth muscle) cells of the afferent arteriole.

__________ cells → serve as baroreceptors sensitive to blood pressure within the arteriole.

__________ cells → monitor and respond to changes in the osmolarity (or electrolyte composition) of the filtrate in the tubule.

12. After the juxtaglomerular apparatus, the tubule becomes the distal tubule, which merges with the cortical collecting duct. The cortical collecting duct contains two functional types of cells:

__________ cells → hormones regulate their permeability to water and solutes.

__________ cells → these cells secrete hydrogen ions for acid/base regulation.

13. The medullary collecting duct is composed of _______________ cells.
Their permeability to _________ and ____________ is hormonally regulated.