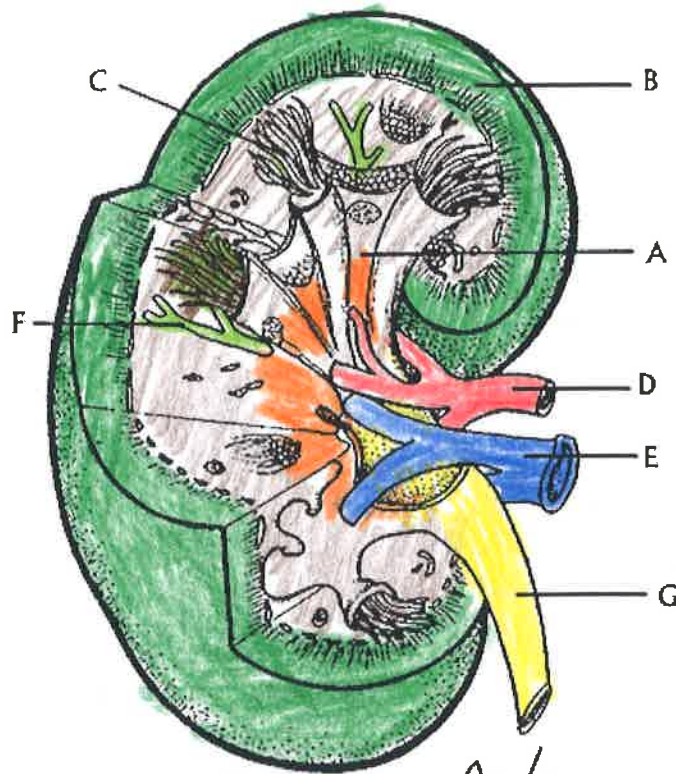
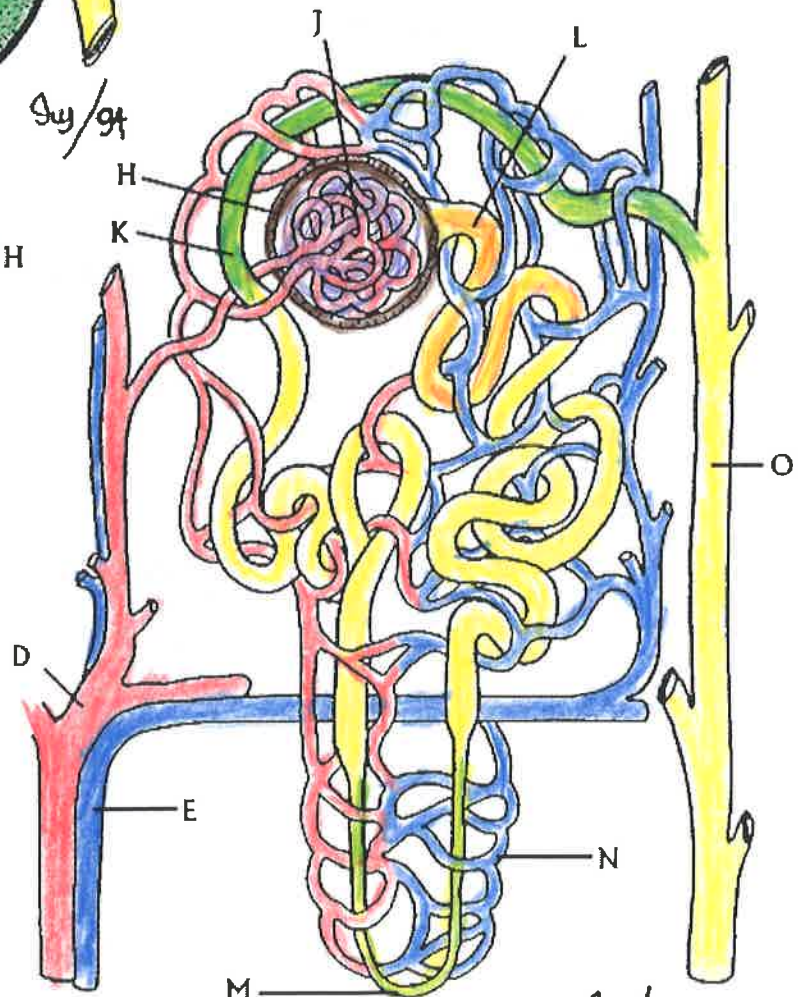


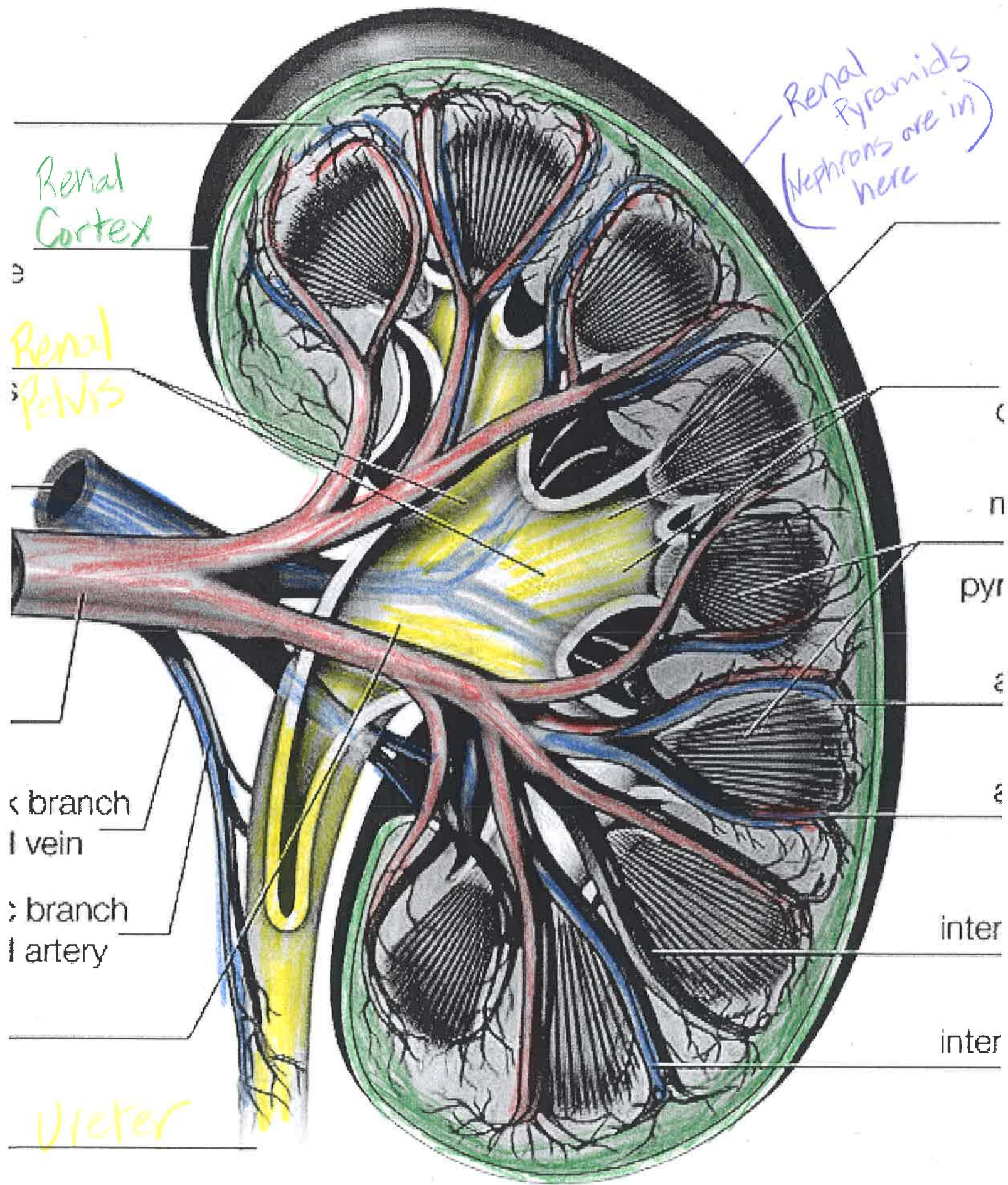
STRUCTURE OF THE NEPHRON



- RENAL PELVIS** _A
- CORTEX** _B
- MEDULLA** _C
- RENAL ARTERY** _D
- RENAL VEIN** _E
- NEPHRON** _F
- URETER** _G

- BOWMAN'S CAPSULE** _H
- GLOMERULUS** _J
- DISTAL TUBULE** _K
- PROXIMAL TUBULE** _L
- LOOP OF HENLE** _M
- CAPILLARIES** _N
- COLLECTING DUCT** _O





Renal Cortex

Renal Pyramids
(Nephrons are in here)

Renal Pelvis

branch
vein

branch
artery

Ureter

pyr

inter

inter

Excretory System Worksheet

1. Some of these are not examples of homeostasis: (circle those that are not)

- a. Sweating, erection of hairs and capillary dilation/contraction to control the body temperature
- b. Adjusting the rate of breathing to remove carbon dioxide from the blood
- c. Production of concentrated or dilute urine to maintain the concentration of water and salts in the blood within a narrow range
- d. Blood clotting to prevent loss of blood
- e. Reproduction to produce the next generation
- f. The action of the hormone insulin to keep the level of glucose in the blood within a narrow range
- g. White cells engulfing bacteria
- h. Eating to supply the body with essential nutrients
- i. Sense organs that allow the animal to sense and then remove itself from unsafe conditions
- j. Various mechanisms to keep the pH of the blood within a narrow range

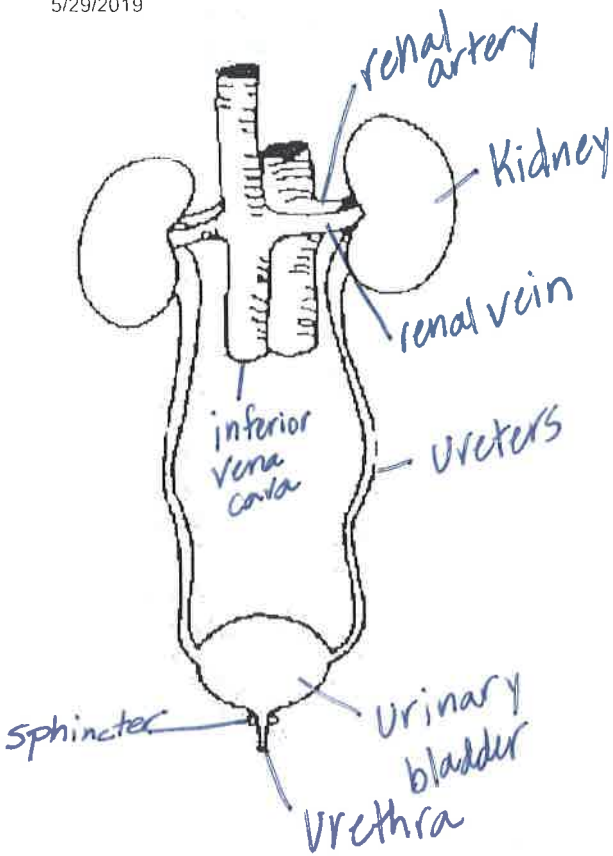
2. Fill in the left hand column with the terms/values from the list below.

~~15%~~; ~~thirst~~; ~~66%~~; ~~80%~~; ~~kidneys~~; ~~hypothalamus~~

<u>66%</u>	The proportion of the body's water found within the cells
<u>hypothalamus</u>	The part of the brain concerned with controlling water balance
<u>15%</u>	The proportion of the body's water an animal will not survive losing
<u>thirst</u>	This is the main mechanism for diluting the blood
<u>80%</u>	The proportion of an animal's body that consists of water
<u>Kidneys</u>	These organs are important for controlling water balance

3. Add the following labels to the diagram below of the urinary system of a mammal.

~~kidney~~; ~~bladder~~; ~~ureters~~; ~~uretra~~, renal ~~artery~~ and ~~vein~~, inferior ~~caudal~~ ~~vena~~ ~~cava~~, ~~sphincter~~.



4. These are functions of the kidney: (Circle 4)

- a. breaking down damaged blood cells
- b. controlling the concentration of water in the blood**
- c. Removing urea from the blood**
- d. Removing carbon dioxide from the blood
- e. Removing glucose from the blood
- f. Keeping the blood at the right pH (acidity/alkalinity)**
- g. Digesting food
- h. Controlling the concentration of salts like sodium and potassium chloride in the blood**

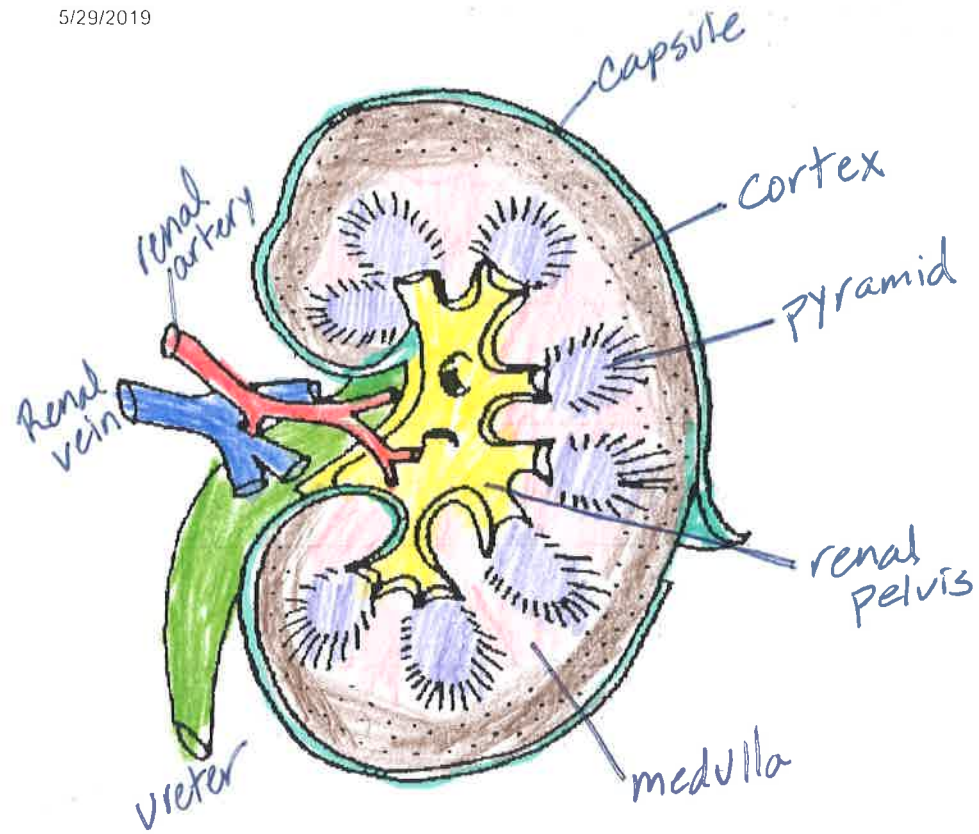
5. Match the organ with the function in the table below.

~~Kidney~~; ~~cortex~~; ~~ureter~~; ~~bladder~~; ~~renal vein~~; ~~urethra~~; ~~capsule~~; ~~medulla~~; ~~renal pelvis~~; ~~renal artery~~; ~~sphincter~~

Organ	Function
Urethra	Carries urine from the bladder to the outside of the body
Renal vein	Carries deoxygenated blood away from the kidney
Medulla	The inner region of the kidney

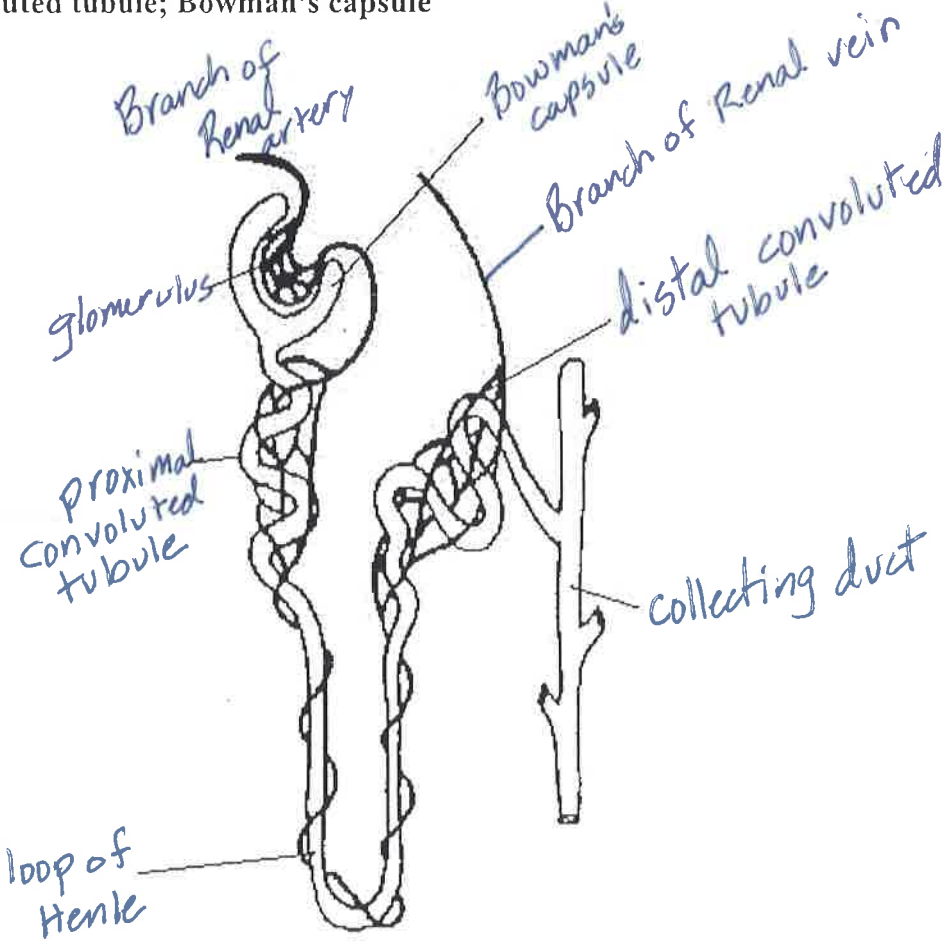
<u>Sphincter</u>	Muscle that opens to allow urine to be removed from bladder
<u>Cortex</u>	The outer region of the kidney
<u>Renal Artery</u>	Carries oxygenated blood to the kidney
<u>Renal Pelvis</u>	The part of the kidney that collects the urine before it passes down the ureter
<u>Capsule</u>	The tough fibrous coat around the kidney
<u>urinary bladder</u>	Stores urine before it is removed from body
<u>ureter</u>	The tube that carries urine away from the kidney
<u>Kidney</u>	Converts blood to urine

6. Add the following labels to the diagram of a kidney below. If you like you can also colour in the diagram as indicated. ~~capsule~~ - turquoise; renal artery - red; renal vein - blue; ~~cortex~~ - brown; medulla - pink; pelvis - yellow; ureter - green; pyramids - purple



7. Add the following labels to the diagram below of a kidney tubule or nephron.

collecting duct; branch of renal artery; loop of Henle; distal convoluted tubule; glomerulus; proximal convoluted tubule; Bowman's capsule



8. Arrange these parts of the kidney tubule in the order in which the fluid that is being converted into urine passes through them.

collecting duct (CD); loop of Henle (LH); distal convoluted tubule (DCT); glomerulus (G); proximal convoluted tubule (PCT); Bowman's capsule (BC)

glomerulus, Bowman's capsule, proximal convoluted tubule, Loop of Henle, distal convoluted tubule, collecting duct

9. Indicate whether these parts of the kidney tubule are found in the cortex "C" or the medulla "M" of the kidney.

- Bowman's capsule C M
- Collecting duct C M
- Proximal convoluted tubule C M
- Distal convoluted tubule C M
- Glomerulus C M
- Loop of Henle C M

10. Match the part of the kidney tubule with its function.

collecting duct; loop of Henle; distal convoluted tubule; glomerulus; proximal convoluted tubule; renal artery; Bowman's capsule; Antidiuretic hormone or ADH.

Part of tubule	Function
<i>Renal Artery</i>	Carries blood to the kidney
<i>Antidiuretic hormone ADH</i>	The hormone that is involved in producing concentrated urine
<i>Bowman's capsule</i>	Cup shaped structure through which the fluid part of the blood is filtered
<i>Collecting duct</i>	Where the majority of water is extracted from the urine
<i>Loop of Henle</i>	Looped portion of the tubule. Important for helping concentrate the urine
<i>Distal convoluted tubule</i>	Where hydrogen and potassium ions are secreted into the urine
<i>Proximal convoluted tubule</i>	Glucose, salts, water and amino acids are reabsorbed into the blood capillaries here
<i>Glomerulus</i>	Tuft of capillaries carrying high pressure blood

11. Circle the substances in the list below that are NOT found in the fluid that has filtered through into the Bowman's capsule of a healthy animal?

water; sodium chloride; red blood cells; glucose; amino acids; proteins; urea; white blood cells

these are too large

12. Circle the substances in the list below that are NOT found in the urine of a healthy animal?

antidiuretic hormone; water; urea; red blood cells; mucus; glucose; proteins; sodium chloride; white blood cells

13. Fill in the blanks in the statements below about antidiuretic hormone (ADH).

- a. ADH is produced by the hypothalamus
- b. ADH acts on the walls of the collecting ducts of the kidney tubule.
- c. When no ADH is produced an animal is said to have the condition known as diabetes insipidus

Now cross out the option that does not apply in each of the statements below:

- d. ADH makes the walls permeable / ~~impermeable~~ to water.
- e. ADH is secreted when the blood becomes too concentrated / ~~too dilute~~.
- f. When an animal is dehydrated ~~no~~ / lots of ADH is produced.
- g. When ADH is secreted the urine produced is concentrated / ~~dilute~~.
- h. The main symptom of a failure to produce ADH would be lots of dilute urine / ~~little concentrated urine~~

14. Normally all the glucose filtered into the kidney tubule is absorbed further down the tubule. If glucose is found in the urine what might one suspect to be the cause?

*Problems with production of insulin by the pancreas
diabetes mellitus*

[Redacted]

[Redacted]

[Redacted]

[Redacted]

[Redacted]

[Redacted]