

Name: \_\_\_\_\_ Block: \_\_\_\_\_ Date: \_\_\_\_\_

## Biology 12 - Excretion

⇒ Part A: Definitions: Define the following terms, **IN YOUR OWN WORDS, IN AS FEW WORDS AS CLARITY ALLOWS.**

i.	excretion	process by which body rids itself of metabolic wastes
ii.	ammonia	toxic waste product of protein/nitrogen compound metabolism
iii.	urea	compound that liver converts NH <sub>3</sub> to when producing nitrogenous wastes
iv.	Uric acid	another nitrogenous waste product excreted by the kidneys
v.	creatinine	a nitrogenous waste from breakdown of creatinine phosphate in muscle cells
vi.	kidneys	principle organs of excretion, filter blood, control blood volume, adjust blood pH
vii.	ureters	tubes that carry urine from kidney to bladder via peristalsis
viii.	Urinary bladder	muscular sac that stores urine, empties via urethra
ix.	urethra	carries urine from bladder to outside of body, passes through penis in males
x.	cortex	outer region of organ such as kidney. In kidney, contains glomeruli, capsule, tubules
xi.	medulla	inner region of kidney. Striated due to presence of many collecting ducts. Salty.
xii.	pelvis	hollow region inside kidney to which collecting ducts lead, and into which urine collects
xiii.	nephrons	functional unit of kidneys that perform all the kidney's functions
xiv.	Bowman's capsule	Cup-like open end of the nephron, contains glomeruli
xv.	Proximal convoluted tubule	Found in cortex region of nephron, site of selective reabsorption in nephron
xvi.	Distal convoluted tubule	Found in cortex region of nephron, site of tubular excretion in nephron
xvii.	Collecting duct	reabsorbs water, carries urine to renal pelvis
xviii.	glomerulus	tuft of capillaries through which blood is filtered, under high pressure, in kidneys
xix.	Peritubular capillary network	network of capillaries that surrounds nephron and reabsorbs water and nutrients from filtrate
xx.	Pressure filtration	first step in urine formation, occurs in glomeruli, forces small molecules into Bowman's capsule
xxi.	filtrate	the solution containing wastes plus water and small nutrients that is filtered from the blood
xxii.	Selective reabsorption	2nd step of urine formation, H <sub>2</sub> O, nutrients, salts reabsorbed actively & passively into blood
xxiii.	Tubular excretion	step of urine formation in which wastes like penicillin, histamine added to urine, ADH acts here
xxiv.	Antidiuretic hormone	ADH, released by pituitary gland, causes distal tubule and collecting duct to reabsorb more water

### Part B - Short Answers

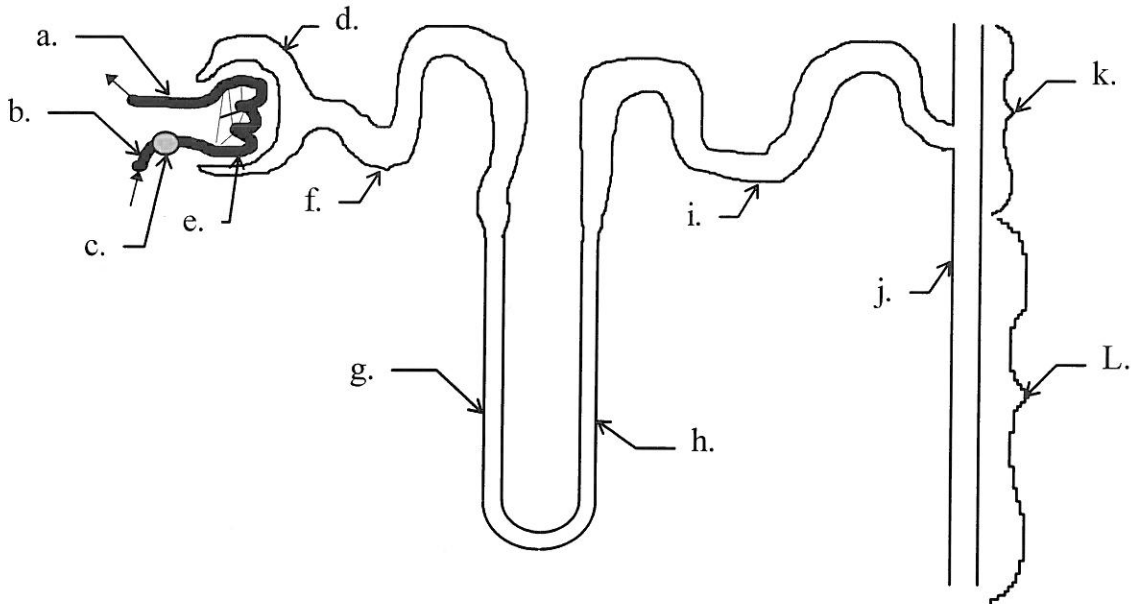
- Urea is a waste product from **AMINO ACID** metabolism and is made in the **LIVER** and excreted by the **KIDNEYS**.
- The primary type of waste found in urine is **NITROGENOUS** waste.
- The outermost portion of the kidney is called the **CORTEX**. The middle layer is called the **MEDULLA**. Urine collects in the cavity called the renal **PELVIS**.
- Arrange the following in the correct sequence in which they function in urine formation:

collecting duct	distal convoluted tubule	Bowman's Capsule	proximal convoluted tubule	loop of Henle
<b>BOWMAN'S CAPSULE</b>	<b>PROXIMAL CONVOLUTED TUBULE</b>	<b>LOOP OF HENLE</b>	<b>DISTAL CONVOLUTED TUBULE</b>	<b>COLLECTING DUCT</b>

- Name a substance that is filtered, maximally reabsorbed, and still in urine. **WATER OR NA<sup>+</sup>CL**
- Glucose is not normally found in the urine; it is reabsorbed totally by means of **ACTIVE TRANSPORT**.
- When ADH is present, urine production **DECREASES**.
- If the blood is acidic, **HYDROGEN** ions are excreted in combination with **AMMONIA**, while **SODIUM** and bicarbonate ions are reabsorbed.

9. The functional units of the kidneys are called **NEPHRONS**. Each kidney has about one **MILLION** of them.  
 10. Please label the following parts on the diagram of the nephron.

A. <b>EFFERENT ARTERIOLE</b>	E. <b>GLOMERULI</b>	I. <b>DISTAL CONVOLUTED TUBULE</b>
B. <b>AFFERENT ARTERIOLE</b>	F. <b>PROXIMAL CONVOLUTED TUBULE</b>	J. <b>COLLECTING DUCT</b>
C. <b>JUXTAGLOMERULAR APPARATUS</b>	G. Descending Limb of <b>LOOP OF HENLE</b>	K. <b>CORTEX</b> Region of Kidney
D. <b>BOWMAN'S CAPSULE</b>	H. <b>ASCENDING</b> Limb of Loop of Henle	L. <b>MEDULLA</b> Region of Kidney



11. Using the letters from the above, indicate the location or locations that best fit the description:

a) Glucose is reabsorbed?	<u>F</u>	b) Impermeable to H <sub>2</sub> O	<u>H</u>
c) Impermeable to salt	<u>G, J</u>	d) responsible for hypertonic urine	<u>G, H, J</u>
e) site of pressure filtration	<u>E</u>	f) place where pH is adjusted	<u>F, I</u>
g) releases Renin to increase blood pressure	<u>C</u>	h) contains dissolved proteins	<u>A, B</u>
l) ADH primarily acts here	<u>I, J</u>	j) site of selective reabsorption	<u>F</u>
k) site of tubular excretion	<u>I</u>	l) bicarbonate ions actively reabsorbed here	<u>I</u>
m) region with the "saltiest" cells	<u>L</u>	n) H <sub>2</sub> O reabsorbed here	<u>F, G, I, J</u>
o) penicillin would be excreted here	<u>I</u>	p) contains urine	<u>J</u>
q) cells here would have a lot of mitochondria	<u>F, I</u>	r) wastes leave the blood here	<u>E</u>

12. If the blood is alkaline, fewer **HYDROGEN** ions are excreted and fewer **SODIUM** and bicarbonate ions are reabsorbed.  
 13. One end of the nephron is shaped into a double-layered, cup-like structure which may be called a **BOWMAN'S CAPSULE**.  
 14. Many collecting ducts join together to empty into the **PELVIS**.  
 15. The duct that carries urine from the bladder to the outside is the **URETHRA**.  
 16. The ureter carries urine from the **KIDNEY** to the **BLADDER**.  
 17. The solution produced when blood is filtered through the walls of the glomerulus and the nephric capsule is called the **FILTRATE**.  
 18. The force that causes filtration is **BLOOD PRESSURE**.  
 19. The organs of excretion most responsible for ridding the body of CO<sub>2</sub> are the **LUNGS**.  
 20. Aldosterone is a hormone that is produced in the **CORTEX** of the **ADRENAL** glands.  
 21. Aldosterone regulates the levels of **SODIUM** ions and **POTASSIUM** ions in the blood. It causes the nephron to **REABSORB** more sodium back into the blood and **EXCRETE** more potassium from the blood into the urine.  
 22. The renal vein would carry blood that is **LOW** in oxygen and **LOW** in urea.  
 23. The renal artery would carry blood that is **HIGH** in oxygen and **HIGH** in urea.  
 24. List four other organs of excretion besides the kidneys:

<u>SKIN</u>	<u>LIVER</u>	<u>LUNGS</u>	<u>INTESTINE</u>	
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25. True or false: The solution in a kidney dialysis machine should contain glucose. **TRUE**