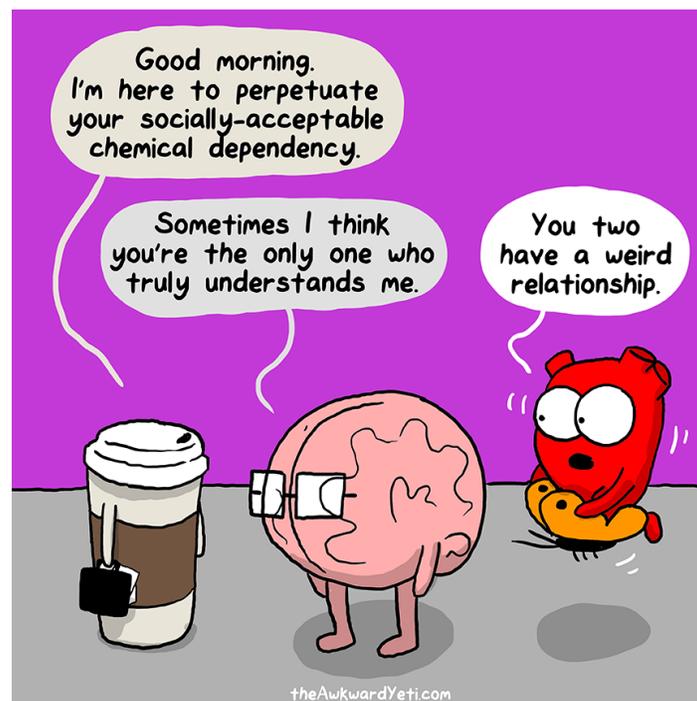


## UNIT 5 CONCEPT OVERVIEW

### Nervous System & Urinary System

#	<u>Concepts &amp; Elaborations</u>
5-1	<b>Interrelationships of the structures of the brain &amp; branches of the nervous system</b> <ul style="list-style-type: none"> <li>- Parts of the brain</li> <li>- CNS vs. PNS</li> <li>- Autonomic vs. Somatic</li> <li>- Parasympathetic vs. Sympathetic</li> </ul>
5-2	<b>Transmission of nerve impulses within neurons</b> <ul style="list-style-type: none"> <li>- Neuron Structure &amp; Function</li> <li>- Nerve impulse</li> <li>- Action Potential</li> </ul>
5-3	<b>Transmission of nerve impulses between neurons</b> <ul style="list-style-type: none"> <li>- Synapses</li> <li>- Reflex Arc</li> <li>- Neurotransmitters</li> </ul>
5-4	<b>Relationships between parts of the urinary system and the body</b> <ul style="list-style-type: none"> <li>- Structure &amp; function of kidney</li> <li>- Components of the nephron</li> <li>- Urine production</li> <li>- Regulation of blood pH, water, sodium levels, blood pressure and volume.</li> </ul>



# UNIT 5 REVIEW

## NERVOUS & URINARY SYSTEMS

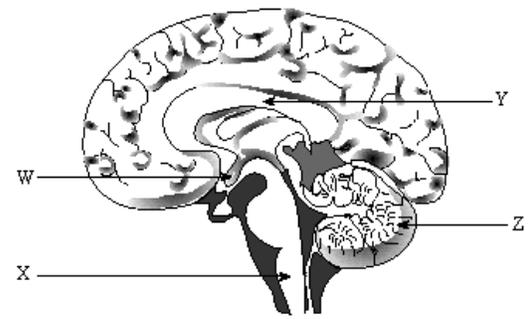
*The following worksheet is intended to augment your revision for the upcoming unit test. It is essential that you understand all the learning outcomes in each component of unit 5.*

### NERVOUS SYSTEM

1. Explain how a neuron maintains a resting potential and why this is important.
2. Describe the upswing and downswing of an action potential with respect to membrane polarity and movement of ions.
3. Describe the events that occur between the time a nerve impulse reaches the end of an axon and the release of the neurotransmitters.
4. What happens to neurotransmitters after they are released into the synaptic cleft?
5. Compare the structural similarities and differences of motor and sensory neurons.
6. a) Explain why the knee-jerk reflex still functions in a person with a severed spinal cord.  
b) Why is there is no sensation of the stimulus?
7. Which part of the nervous system controls hunger and regulates body temperature?  
a) thalamus                      b) cerebellum                      c) hypothalamus                      d) cerebral cortex                      e) medulla oblongata
8. Damage to the medulla oblongata may result in  
a) hearing loss.                      b) impaired growth                      c) breathing difficulty                      d) loss of coordination.
9. Stimuli coming to the brain are screened and channeled by the  
a) cerebrum                      b) cerebellum                      c) hypothalamus                      d) thalamus
10. A drug was observed to have the following effects: **accelerated heart rate, dilation of pupils, reduced peristalsis**. The nervous system affected by this drug is the:  
a) central                      b) somatic                      c) peripheral                      d) sympathetic
11. The hypothalamus is involved in regulating all of the following except  
a) water balance                      b) blood pressure                      c) body temperature                      d) conscious thought
12. For the most part it is proper to associate the  
a) sympathetic nervous system with acetylcholine and emergency situations  
b) parasympathetic nervous system with noradrenalin and emergency situation  
c) sympathetic nervous system with noradrenalin and emergency situations  
d) parasympathetic system with acetylcholine and emergency situations
13. Consciousness is best associated with the  
a) whole brain                      b) frontal lobe only                      c) cerebrum                      d) whole central nervous system
14. The cerebrum in humans  
a) is responsible for memory                      b) controls balance exclusively  
c) is the largest part of the brain                      d) both a and c                      e) all of the above
15. Motor control of muscles originates in the  
a) parietal lobe                      b) cerebellum                      c) frontal lobe                      d) medulla oblongata                      e) temporal lobe
16. Which of these would you best associate with motor control?  
a) medulla and hypothalamus                      b) frontal lobe and cerebellum  
c) thalamus and parietal lobe                      d) occipital lobe and thalamus
17. The main nerve tract that transmits information between the two cerebral hemispheres of the brain is the  
a) thalamus                      b) cerebellum                      c) corpus callosum                      d) medulla oblongata
18. Know the following terms:  
*acetylcholine (ACh), acetylcholinesterase (AChE), action potential, adrenal medulla, adrenalin, "all-or-none" response, autonomic nervous system, axomembrane, axon, axoplasm, calcium ion, cell body, central nervous system, cerebellum, contractile protein, corpus callosum, dendrite, depolarization, effector, excitatory neurotransmitter, hypothalamus, impulse, inhibitory neurotransmitter, interneuron, medulla oblongata, meninges, motor neuron, myelin sheath, myelinated nerve fibre, neuroendocrine control centre, neuron, neurotransmitters, node of Ranvier, norepinephrine, parasympathetic division, peripheral nervous system, pituitary gland, polarity, postsynaptic membrane, potassium gate, presynaptic membrane, receptor, reflex arc, refractory period, repolarization, resting potential, saltatory transmission, Schwann cell, sensory neuron, sodium gate, sodium-potassium pump, somatic nervous system, sympathetic division, synapse, synaptic cleft, synaptic ending, synaptic vesicle, thalamus, threshold value*

19. Identify the structures in the diagram to the right and give one function of each.

	STRUCTURE	FUNCTION
W		
X		
Y		
Z		



**URINARY SYSTEM**

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

i.	excretion	
ii.	ammonia	
iii.	urea	
iv.	uric acid	
v.	creatinine	
vi.	kidneys	
vii.	ureters	
viii.	urinary bladder	
ix.	urethra	
x.	renal cortex	
xi.	renal medulla	
xii.	renal pelvis	
xiii.	nephrons	
xiv.	Bowman's capsule	
xv.	Proximal convoluted tubule	
xvi.	Distal convoluted tubule	
xvii.	Collecting duct	
xviii.	glomerulus	
xix.	Peritubular capillary network	
xx.	Pressure filtration	
xxi.	filtrate	
xxii.	Selective reabsorption	
xxiii.	Tubular excretion	
xxiv.	Antidiuretic hormone	

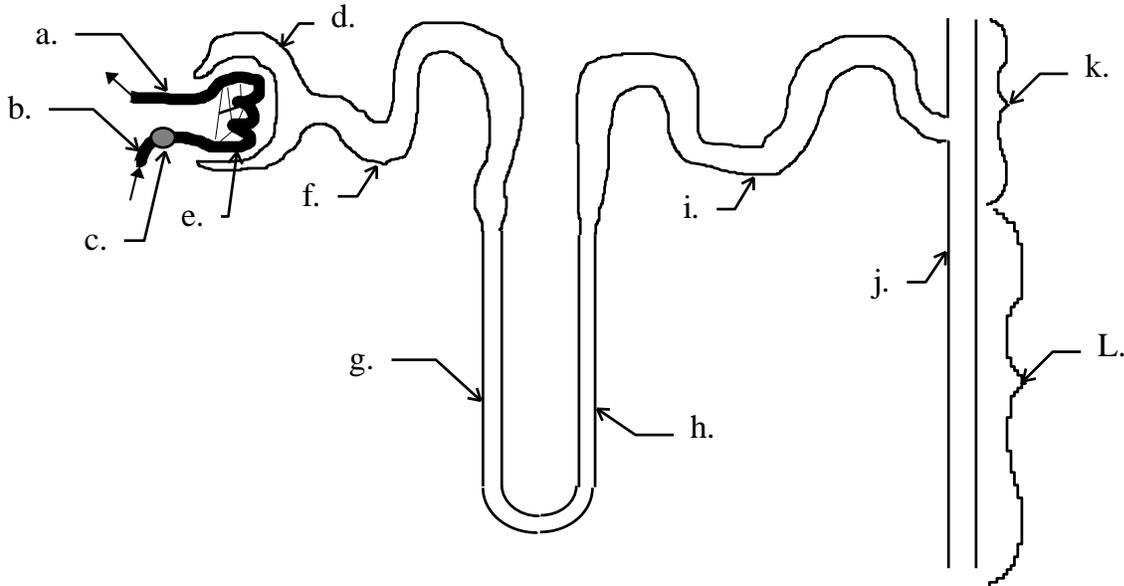
**Part B - Short Answers**

- Urea is a waste product from \_\_\_\_\_ metabolism and is made in the \_\_\_\_\_ and excreted by the \_\_\_\_\_.
- The primary type of waste found in urine is \_\_\_\_\_ waste.
- The outermost portion of the kidney is called the \_\_\_\_\_. The middle layer is called the \_\_\_\_\_. Urine collects in the cavity called the renal \_\_\_\_\_.
- 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
- Name a substance that is filtered, maximally reabsorbed, and still in urine. \_\_\_\_\_
- Glucose is not normally found in the urine; it is reabsorbed totally by means of \_\_\_\_\_.
- When ADH is present, urine production \_\_\_\_\_.
- If the blood is acidic, \_\_\_\_\_ ions are excreted in combination with \_\_\_\_\_, while \_\_\_\_\_ and bicarbonate ions are reabsorbed.

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

A.	E.	I.
B.	F.	J.
C.	G. Descending Limb of	K. _____ Region of Kidney
D.	H. _____ Limb of Loop of Henle	L. _____ Region of Kidney



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

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

12. If the blood is alkaline, fewer \_\_\_\_\_ ions are excreted and fewer \_\_\_\_\_ 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 \_\_\_\_\_.  
 14. Many collecting ducts join together to empty into the \_\_\_\_\_.  
 15. The duct that carries urine from the bladder to the outside is the \_\_\_\_\_.  
 16. The ureter carries urine from the \_\_\_\_\_ to the \_\_\_\_\_.  
 17. The solution produced when blood is filtered through the walls of the glomerulus and the nephric capsule is called the \_\_\_\_\_.  
 18. The force that causes filtration is \_\_\_\_\_.  
 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 \_\_\_\_\_ of the \_\_\_\_\_ glands.  
 21. Aldosterone regulates the levels of \_\_\_\_\_ ions and \_\_\_\_\_ ions in the blood. It causes the nephron to \_\_\_\_\_ more sodium back into the blood and \_\_\_\_\_ more potassium from the blood into the urine.  
 22. The renal vein would carry blood that is \_\_\_\_\_ in oxygen and \_\_\_\_\_ in urea.  
 23. The renal artery would carry blood that is \_\_\_\_\_ in oxygen and \_\_\_\_\_ in urea.  
 24. Explain how the conditions in the renal medulla result in the production of urine which is hypertonic to blood.  
 25. Explain how ADH secretion affects the composition of the blood.  
 26. List the structures, in the correct order, through which a sodium ion passes as it travels through the tubule from the renal artery to the renal vein.  
 27. Know the following terms:

*antidiuretic hormone (ADH), adrenal cortex, afferent and efferent arterioles, aldosterone, ammonia, Bowman's capsule, collecting duct, glomerulus, glucose, homeostasis, hypothalamus, kidney, loop of Henle, metabolic waste, nephron, nitrogenous waste, osmotic gradient, peritubular capillary network, pH, posterior pituitary, pressure filtration, proximal and distal convoluted tubules, reabsorption of water, renal artery, renal cortex, renal medulla, renal pelvis, renal vein, selective reabsorption, tubular excretion, urea, ureter, urethra, urinary bladder, urine*