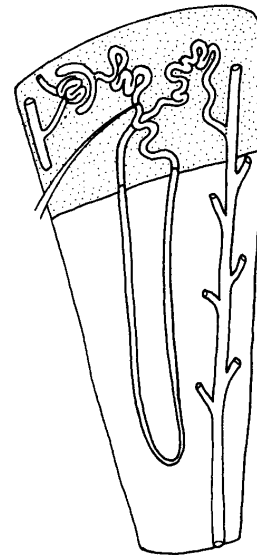
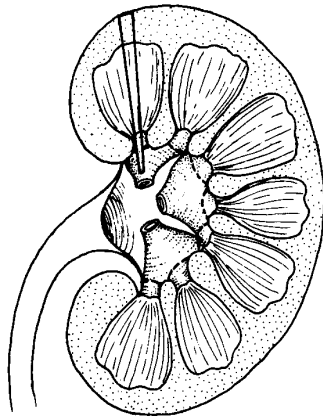


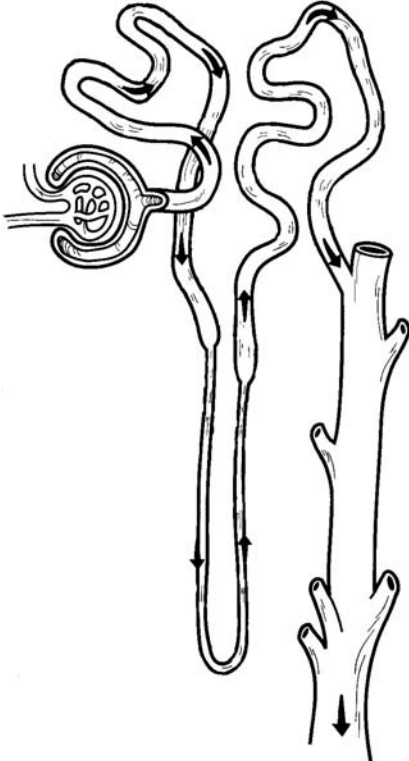
CONTROLLING THE INTERNAL ENVIRONMENT

KIDNEY AND NEPHRON

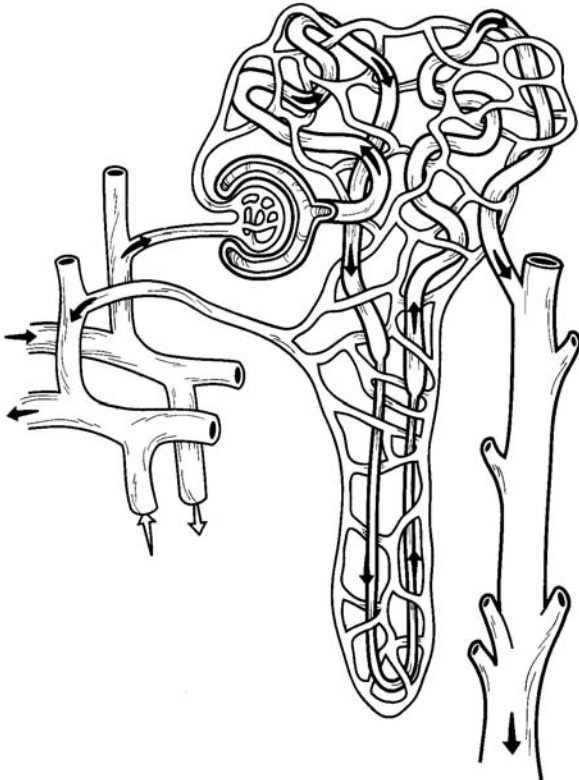


NEPHRON FUNCTIONS

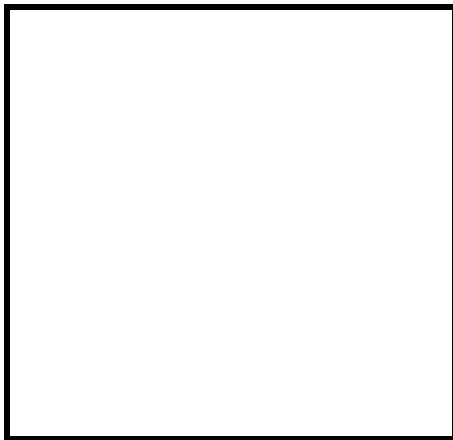
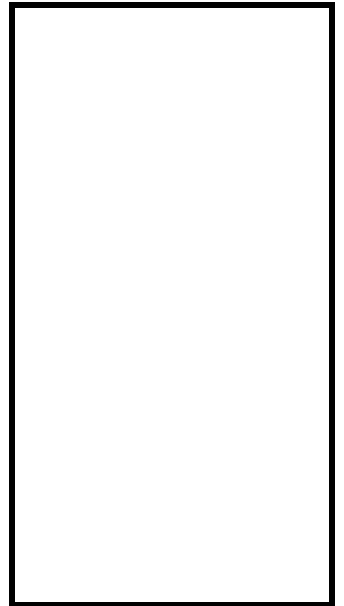
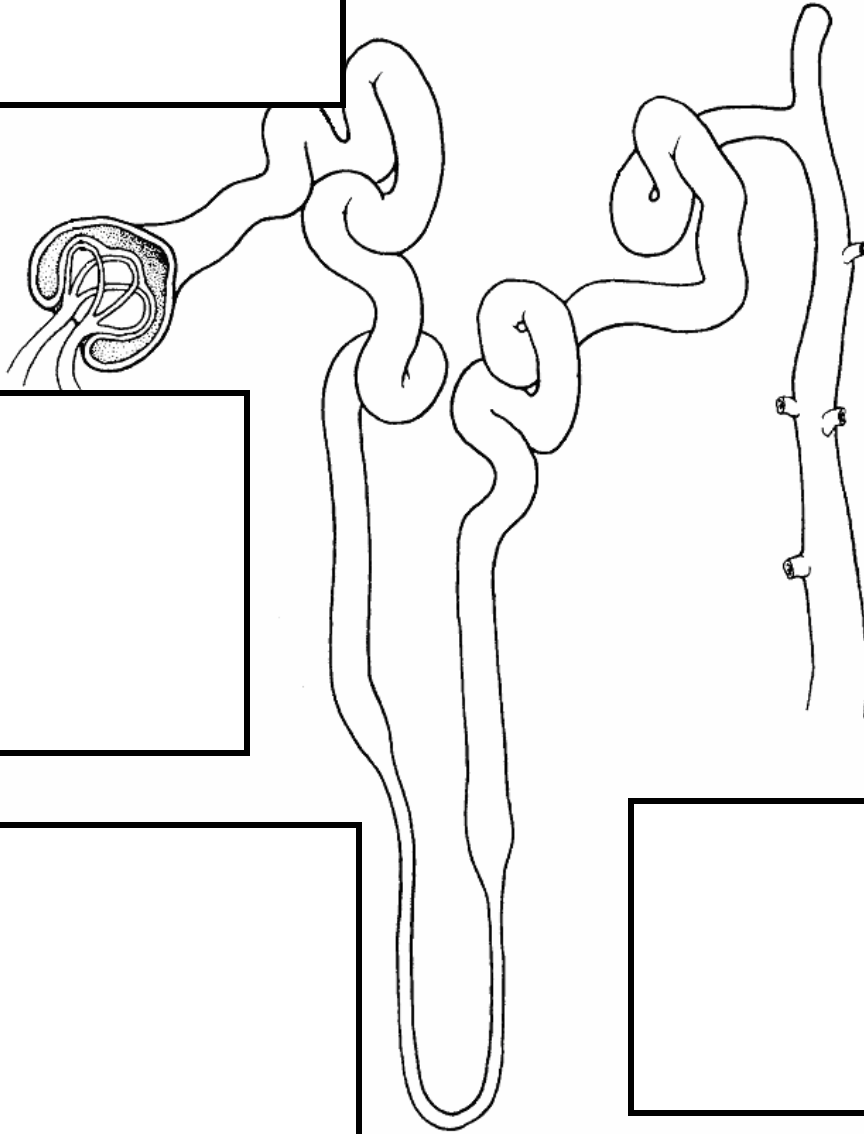
NEPHRON STRUCTURE



NEPHRON BLOOD SUPPLY



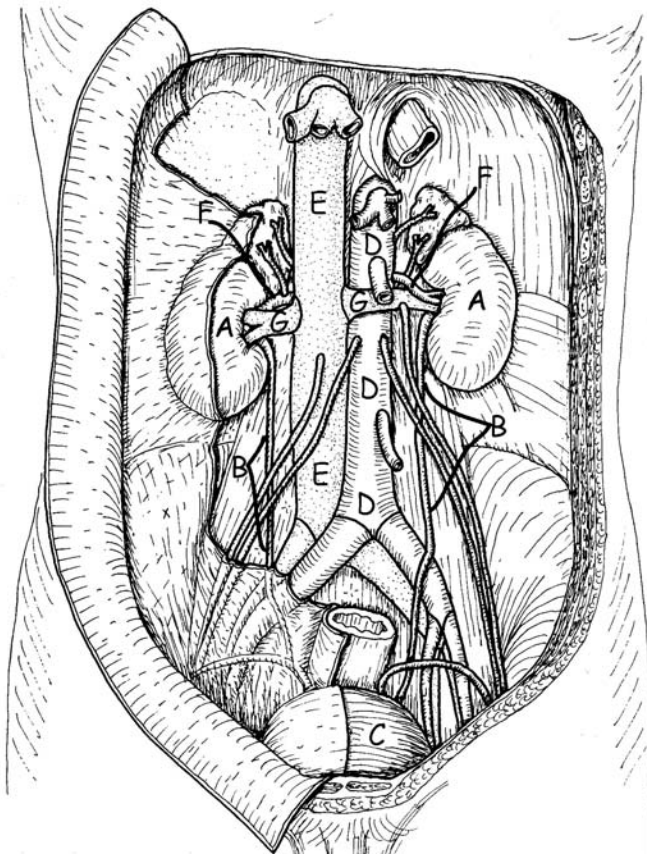
URINE FORMATION



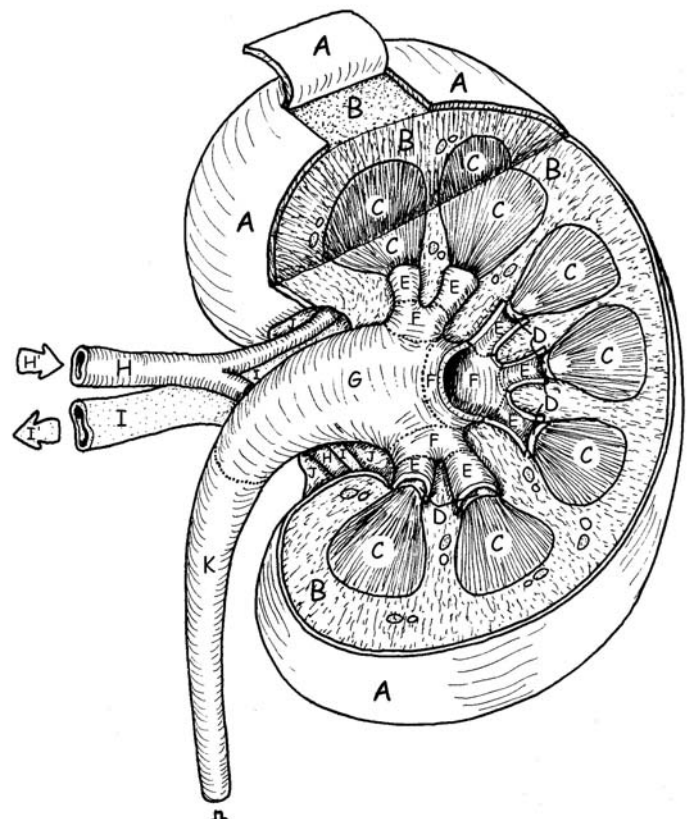
QUESTIONS

1. Color the following parts on the diagrams below.

- Kidney (A)
- Ureter (B)
- Urinary bladder (C)
- Aorta (D)
- Inferior vena cava (E)
- Renal artery (F)
- Renal vein (G)

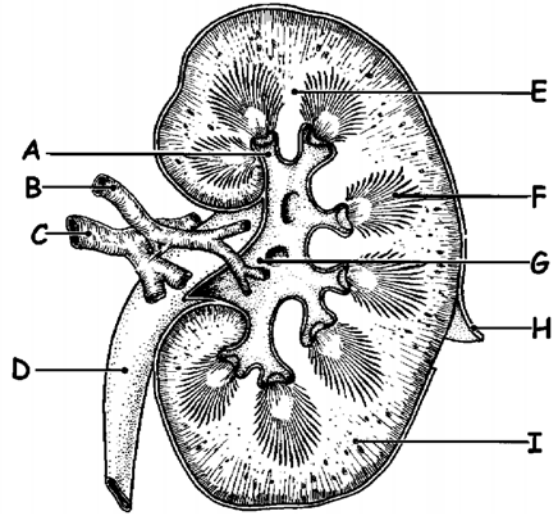


- Renal capsule (A)
- Renal cortex (B)
- Medulla (pyramid) (C)
- Papilla (D)
- Minor calyx (E)
- Major calyx (F)
- Renal pelvis (G)
- Renal artery (H)
- Oxygenated blood (H')
- Renal vein (I)
- Deoxygenated blood (I')
- Renal sinus (J)
- Ureter (K)



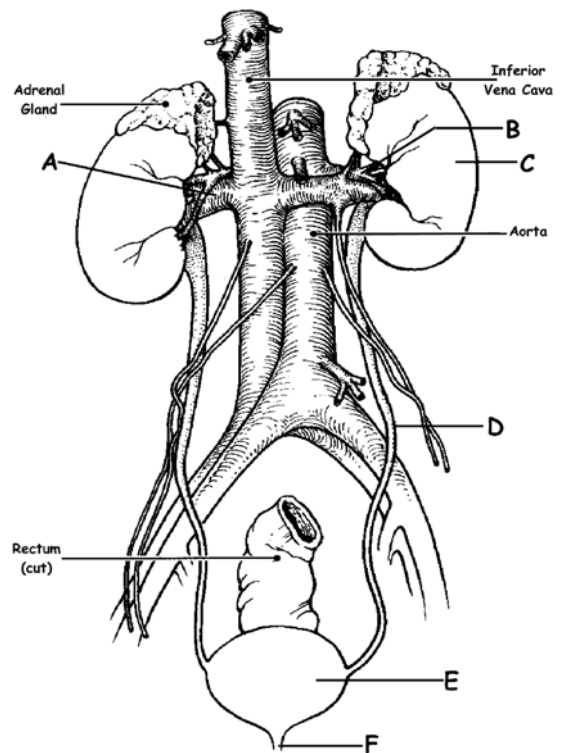
2. Match the structure with the correct letter from the diagram at the right.

- _____ Minor calyx
- _____ Renal artery
- _____ Renal capsule
- _____ Renal column
- _____ Renal cortex
- _____ Renal pelvis
- _____ Renal pyramid
- _____ Renal vein
- _____ Ureter



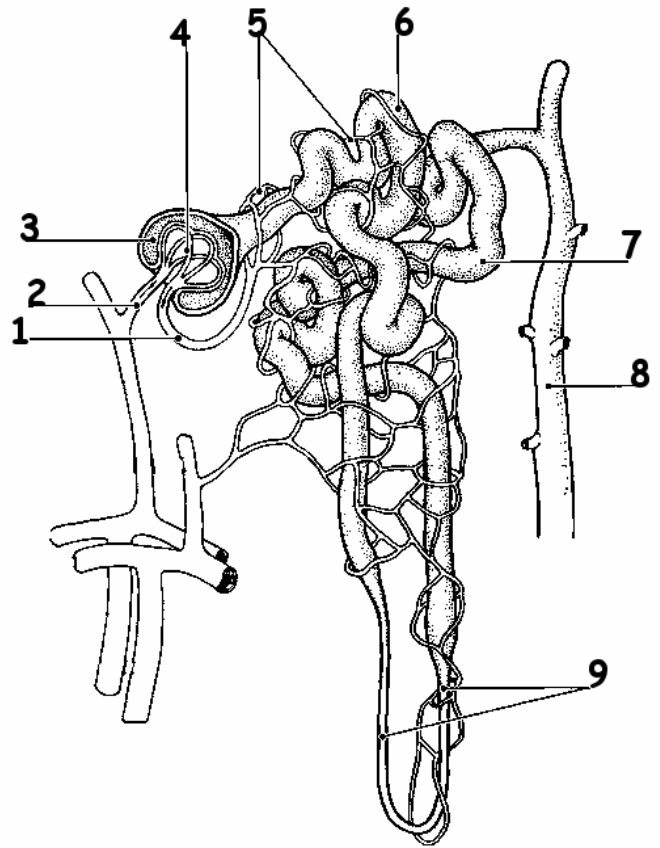
3. Match the function with the correct letter from the diagram.

LETTER	FUNCTION
	Produces urine
	Transport urine toward the urinary bladder
	Carries urine to outside the body
	Temporarily stores urine prior to elimination
	Carries unfiltered blood into the kidney
	Carries filtered blood out of the kidney



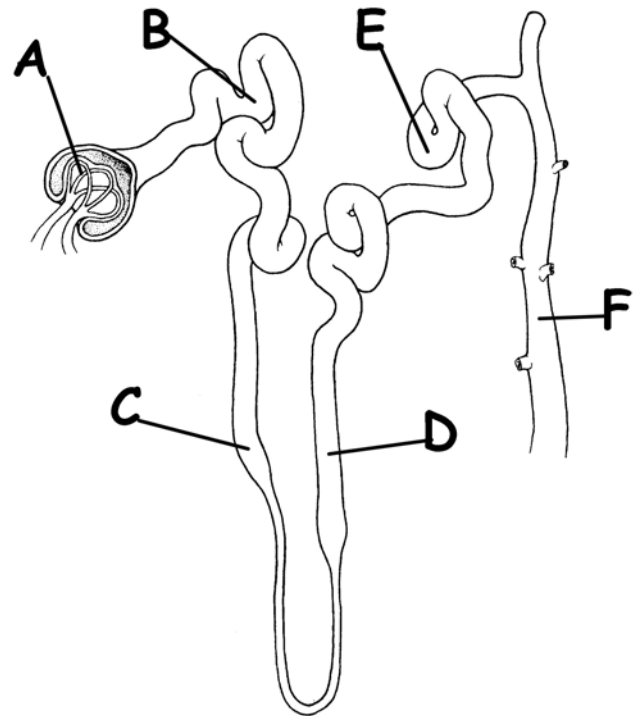
4. Match the structure with the correct number from the diagram.

- _____ Afferent arteriole
- _____ Glomerular capsule
- _____ Collecting duct
- _____ Distal convoluted tubule
- _____ Efferent arteriole
- _____ Glomerulus
- _____ Loop of Henle
- _____ Proximal convoluted tubule
- _____ Peritubular capillaries



5. Match the structure or step with the correct letter from the diagram.

- _____ Collecting duct
- _____ Distal convoluted tubule
- _____ Glomerulus
- _____ Loop of Henle ascending limb
- _____ Loop of Henle descending limb
- _____ Proximal convoluted tubule
- _____ Production of filtrate; filtrate has the same solute concentration as plasma or interstitial fluid; permeable to both water and solutes
- _____ Reabsorption of water, ions and all organic nutrients
- _____ Water is reabsorbed along this section because the wall is permeable to water but not solutes



_____ This section is impermeable to water and to solutes; tubular cells actively pump sodium and chloride ions out of the tubular fluid

_____ Secretion of ions, acids, drugs, toxins; variable reabsorption of water and sodium ions

_____ Variable reabsorption of water and reabsorption or secretion of sodium, potassium, hydrogen and bicarbonate ions

6. What is the functional unit of the kidney called?

7. What is the primary purpose of urine production?

8. Define the following terms:

Thermoregulation	
Osmoregulation	
Excretion	

9. List and describe the four physical processes that account for heat gain and loss.

10. A constant body temperature does not distinguish ectotherms from endotherms. Why?

What does distinguish ectotherms from endotherms?

11. What four adaptations have helped animals, both ectotherms and endotherms, regulate body temperature?

12. Match the term with the correct definition.

- A. Countercurrent exchange
- B. Vasoconstriction
- C. Vasodilation

_____ Increase in the diameter of superficial blood vessels that results in increased blood flow through the vessels

_____ Decrease in the diameter of superficial blood vessels that results in decreased blood flow through the vessels

_____ The opposite flow of adjacent fluids that maximizes transfer rates; important in controlling heat loss in many endothermic animals

13. Examine Figure 44.8 p. 872.

a. How does the human body respond to an increase in body temperature?

b. How does the human body respond to a decrease in body temperature?

14. Define the following terms.

Torpor	
Hibernation	
Estivation	

15. What is the source of nitrogenous wastes in animals?

16. In what form are nitrogenous wastes excreted in:

a. aquatic animals? _____

b. terrestrial animals? _____

17. Why do terrestrial animals convert ammonia to urea or uric acid before excretion?

18. Examine Figure 44.21 p. 888.

- a. How does the human body respond to an increase in blood osmolarity, due to dehydration or eating salty foods, above a set point?

- b. How does the human body (specifically the rennin-angiotensin-aldosterone system) respond to low blood pressure and low blood volume?
