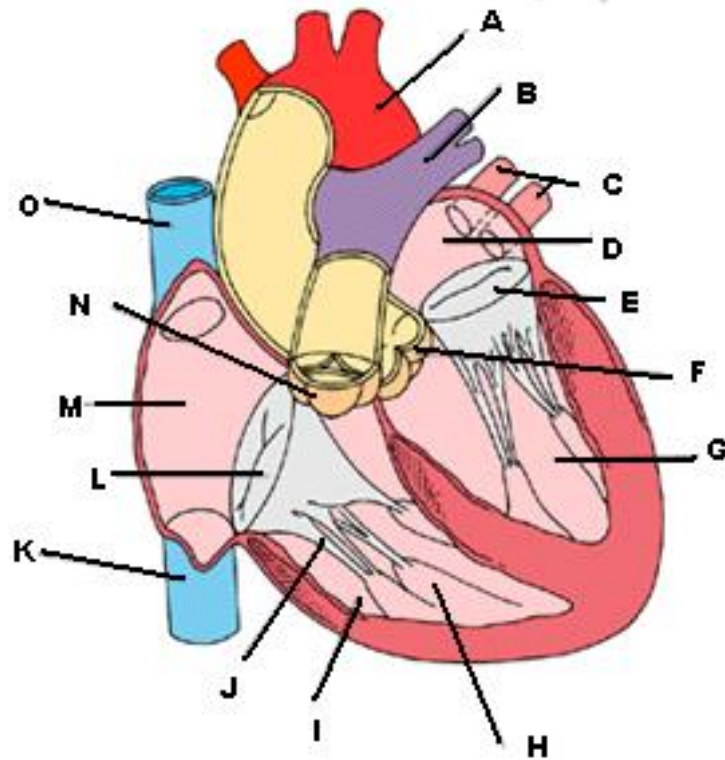


**2019 ANATOMY & PHYSIOLOGY  
Sample Tournament**

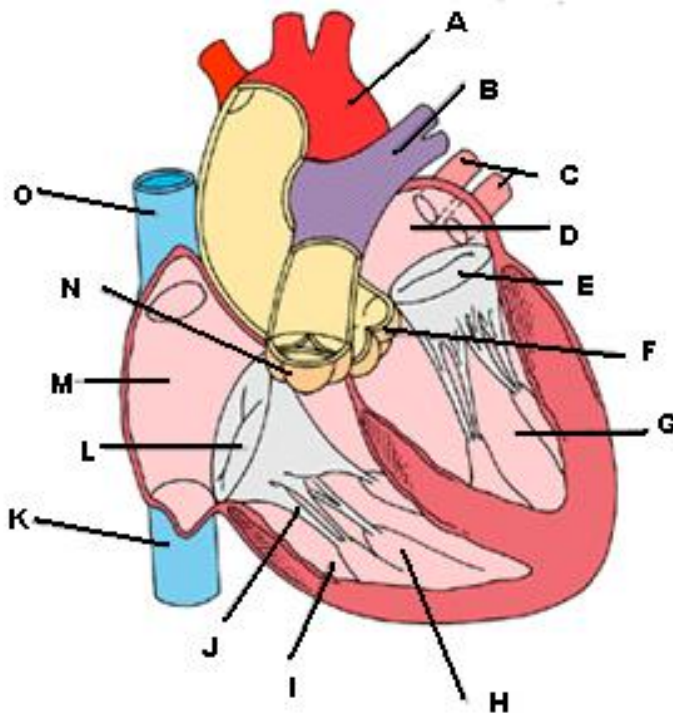
**Station A: Examine the diagram of the Heart and answer the following questions.**



1. Name and give the function of the structure labeled **A**.
2. Name and give the function of the structure labeled **K**.
3. Name and give the function of the structure labeled **G**.
4. Name and give the Function of the structure labeled **M**.
5. Name and give the function of the structure labeled **E**.
6. Name and give the function of the structure labeled **L**.
7. Name and give the function of the structure labeled **B**.
8. Name and give the function of the structure labeled **F**.
9. Name and give the function of the structure labeled **C**.
10. Name and give the function of the structure labeled **I**.

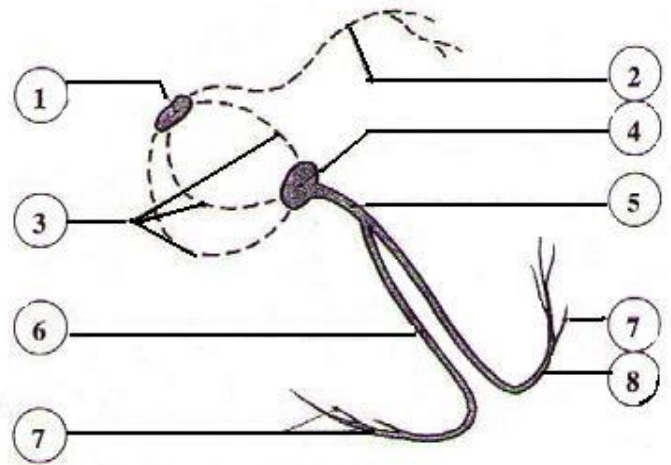
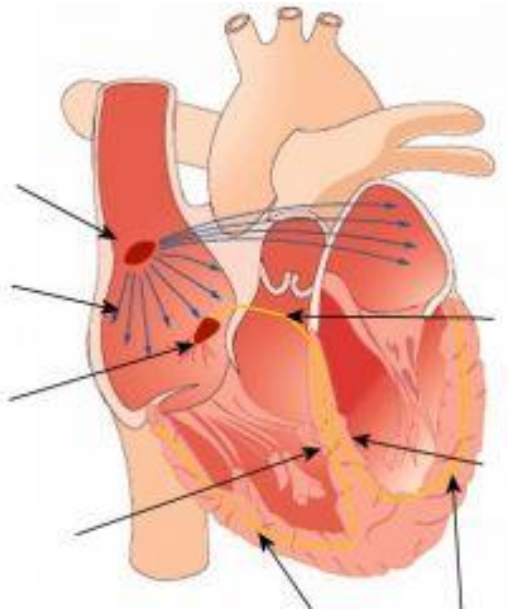
**2019 ANATOMY & PHYSIOLOGY  
Sample Tournament**

**Station A: Examine the diagram of the Heart and answer the following questions.**



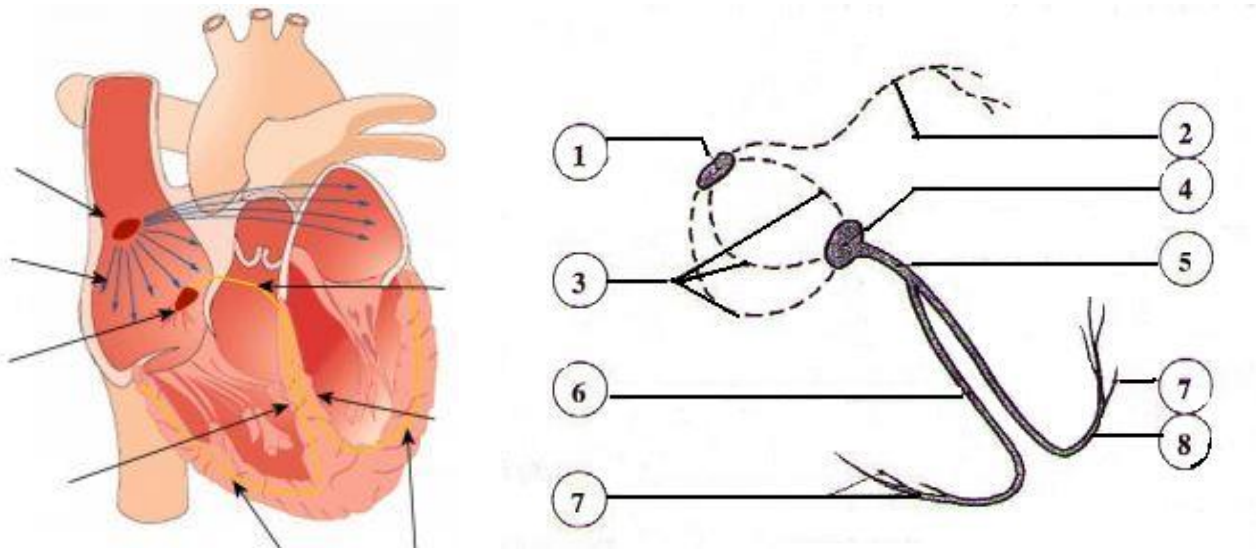
1. Name and give the function of the structure labeled A.  
*Aorta – carries oxygenated blood from heart to body*
2. Name and give the function of the structure labeled K.  
*Vena cava – brings blood back to heart from body*
3. Name and give the function of the structure labeled G.  
*Left ventricle – pumps blood through aorta to body*
4. Name and give the Function of the structure labeled M.  
*Right Atrium – collects blood coming in from vena cava*
5. Name and give the function of the structure labeled E .  
*Mitrial valve - keeps blood from sloshing back into left atrium from rt. ventricle*
6. Name and give the function of the structure labeled L.  
*Tricuspid valve - prevent flow from the rt. ventricle back into the rt. atrium*
7. Name and give the function of the structure labeled B.  
*Pulmonary artery - carry blood from the heart to the lungs to pick up oxygen*
8. Name and give the function of the structure labeled F.  
*Aortic valve- prevent back from the aorta into the left ventricle*
9. Name and give the function of the structure labeled C.  
*Pulmonary vein- carry oxygenated blood from the lungs back to the heart*
10. Name and give the function of the structure labeled I.  
*Right ventricle- It collects deoxygenated blood from the right atrium and then forces it into the lungs through the pulmonary valve.*

**Station B:**



**11-20.** Describe the electrical coordination of the heart contraction. Use the following diagram to assist you. Start at # 1 and describe the movement of the current from the heart's pacemaker through the rest of the heart. Indicate the names of the regions involved in your explanation.

**Station B:**

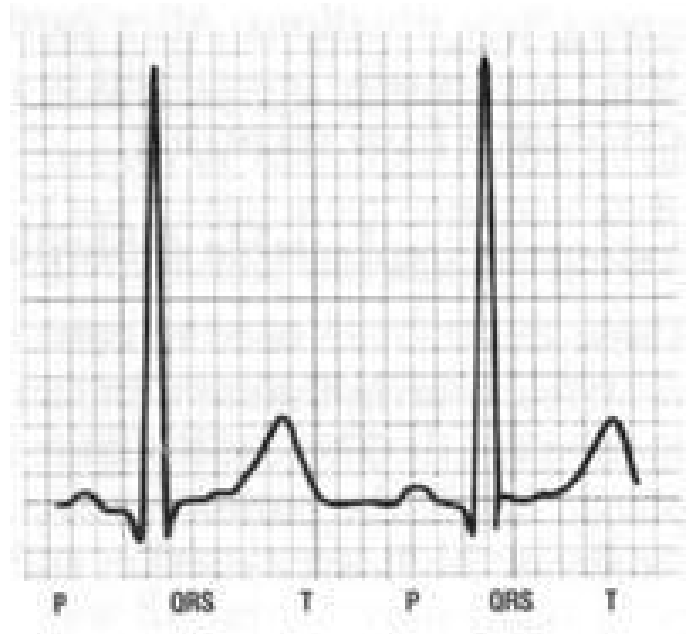
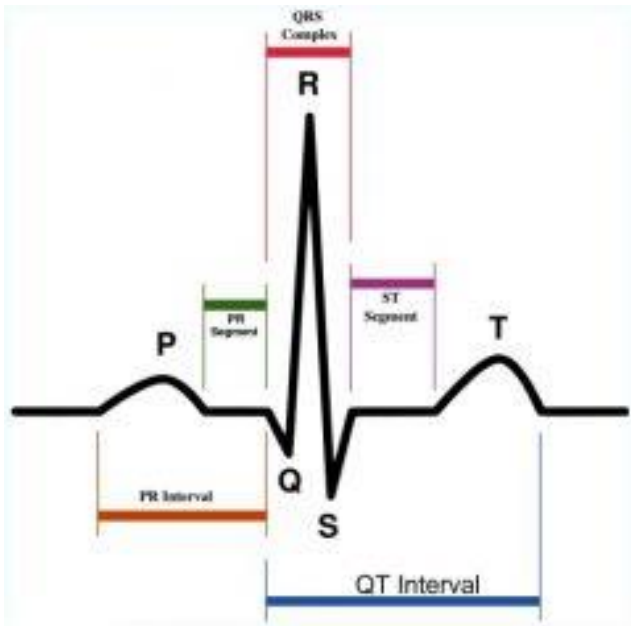


**11-20.** . Describe the electrical coordination of the heart contraction. Use the following diagram to assist you. Start at # 1 and describe the movement of the current from the heart's pacemaker through the rest of the heart. Indicate the names of the regions involved in your explanation.

- 1. Sinoatrial Node (SA Node)-Pacemaker of the heart- The signal (action potential) begins at the SA node- Impulse from SA node spreads in all directions causing atrial to contract.**
- 2. Intra-atrial Pathway-carries electricity through atria**
- 3. Internodal Pathway-carries electricity through atria**
- 4. Atrioventricular Node (AV Node)-Back up pacemaker. Slows conduction - Temporarily pauses at the AV node  
When the impulse reaches AV node, it relays them by way of the AV bundle and Purkinje fibers to the ventricles causing them to contract. Travels down the bundle of His and down the left and right bundle branches**
- 5. Bundle of His-last part of conduction in atria**
- 6. Right Bundle Branch-carry electricity through R. Ventricle**
- 7. Purkinje Fibers-distribute electrical energy to the myocardium**
- 8. Left Bundle Branch-carries electricity through L. Ventricle**
- 9. Reaches the apex of the heart and goes up the ventricle outer walls via the Purkinje system**

**Station C:**

**Examine the EKG diagrams and answer the following questions.**



- 21. Using the diagrams, explain what happens during the **P** phase.
- 22. Using the diagrams, explain what happens during the **QRS** phase.
- 23. Using the diagrams, explain what happens during the **T** phase.
- 24. What occurs in ventricular systole?
- 25. What occurs in ventricular diastole?
- 26. What is Passive filling?
- 27. What occurs during active filling?
- 28. What is this abnormal heart rhythm called?

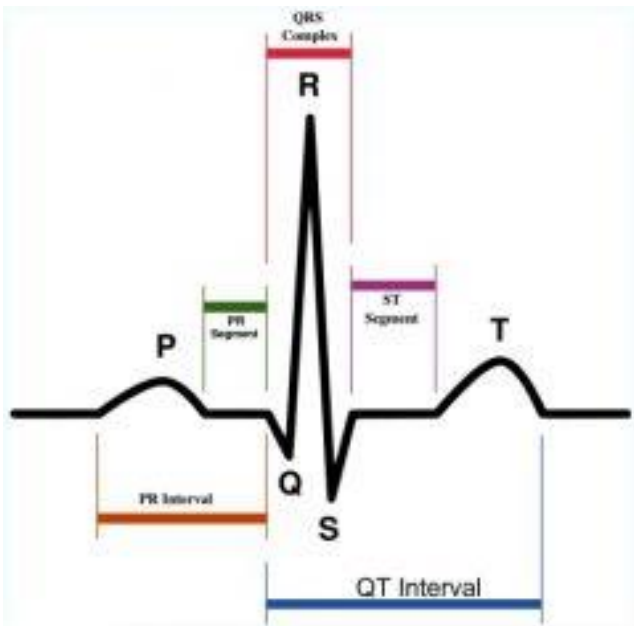


Use the formulas to solve the following problems.

- 29. If systolic pressure is 122 and diastolic pressure is 84, what are the pulse pressure and the Mean Arterial Pressure?
- 30. Mrs. Jones has a heart rate of 85, a systolic pressure of 140 and diastolic pressure of 60, and an end diastolic volume of 110 and end systolic volume of 40. What is her cardiac output?

**Station C:**

Examine the EKG diagrams and answer the following questions.



21. Using the diagrams, explain what happens during the **P** phase.  
*P = atria contract (depolarization)- Marks the beginning of atrial systole*
22. Using the diagrams, explain what happens during the **QRS** phase.  
*QRS = atria relaxes (repolarization) as ventricles contract (depolarization)  
Beginning of ventricular systole*
23. Using the diagrams, explain what happens during the **T** phase.  
*T = ventricles relax (repolarization) Marks the end of ventricular systole.*
24. What occurs in ventricular systole?  
*The left and right ventricles contract simultaneously. AV valves immediately close  
Semilunar valves open after a brief delay*
25. What occurs in ventricular diastole?  
*Left and right ventricles relax simultaneously Semilunar valves immediately close  
AV valves open after a brief delay*
26. What is Passive filling?  
*Ventricles are in diastole. Atria are in diastole AV valves are open Semilunar valves are closed*
27. What occurs during active filling?  
*Ventricles are in diastole Atria are in systole AV valves are open Semilunar valves are closed*
28. What is this abnormal heart rhythm called?  
*Atrial fibrillation-Contains obvious QRS waves but no defined P or T waves. The atria are fluttering and atrial systole is not occurring.,Not immediately fatal because ventricles will fill passively*



Use the formulas to solve the following problems.

29. If systolic pressure is 122 and diastolic pressure is 84, what are the pulse pressure and the Mean Arterial Pressure? **11. *pp = 38 hg of Mercury and MAP = 96.7 rounded to 97***
30. Mrs. Jones has a heart rate of 85, a systolic pressure of 140 and diastolic pressure of 60, and an end diastolic volume of 110 and end systolic volume of 40. What is her cardiac output? ***CO = 5950 mL/min***

**Station D:**

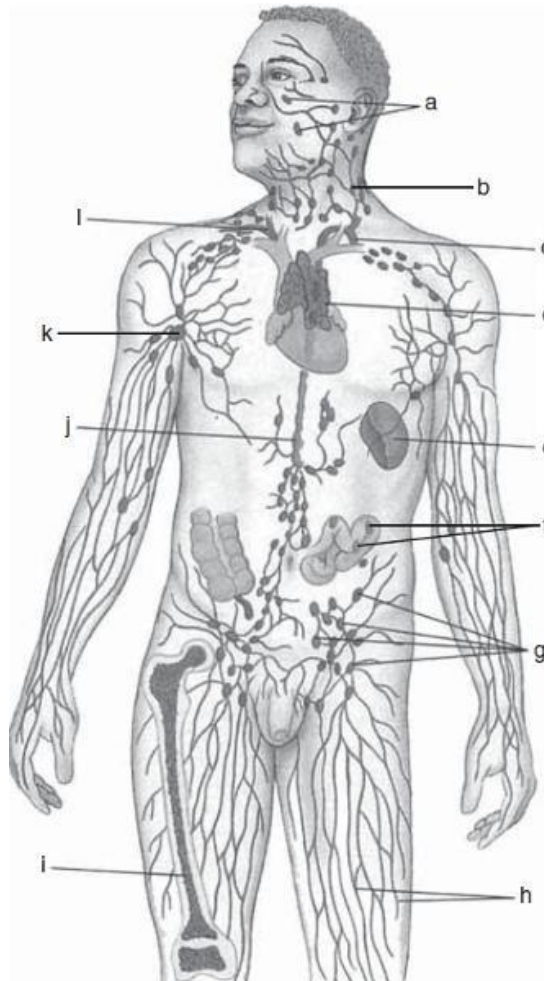
30. Explain the difference between the circulation of blood and the circulation of lymph.
  
32. Trace the flow of blood through the body.
  
33. Trace the flow of lymph through the body.
  
34. What are the characteristics of arteries?
  
35. What are the characteristics of veins?
  
36. Why do veins have valves?
  
37. What is the important function of capillaries?
  
38. What is arteriosclerosis?
  
39. What is atherosclerosis?
  
40. What is a myocardial infraction?

## Station D:

30. Explain the difference between the circulation of blood and the circulation of lymph.  
*Blood is pumped under pressure by the heart while lymph is not is propelled but moves in a passive fashion. Lymph vessels are thin walled, and have valves as do veins.*
32. Trace to flow of blood through the body.  
*Blood Flow: vena cava → right atrium → tricuspid valve → right ventricle → pulmonary valve → pulmonary artery → pulmonary capillary bed → pulmonary veins → left atrium → bicuspid (mitrial valve) → left ventricle → aortic valve → aorta → arteries → arterioles → tissue capillaries → venules → veins → vena cava*
33. Trace the flow of lymph through the body.  
*Lymph Flow: Interstitial fluid → Lymph → Lymph capillary → Afferent lymph vessel → Lymph node → Efferent lymph vessel → Lymph trunk → Lymph duct {Right lymphatic duct and Thoracic duct (left side)} → Subclavian vein (right and left) → Blood → Interstitial fluid...*
34. What are the characteristics of arteries?  
*Large vessels to carry blood away from the heart. Have thick muscular walls*
35. What are the characteristics of veins?  
*Low resistant conduits for return of blood to the heart.*
36. Why do veins have valves?  
*Prevent backflow of blood*
37. What is the important function of capillaries?  
*Site of exchange of nutrients and waste products between blood and tissues.*
38. What is arteriosclerosis?  
*Any hardening (and loss of elasticity) of medium or large arteries*
39. What is atherosclerosis?  
*Common form of arteriosclerosis-cholesterol, lipid, calcium deposits in the walls of the arteries*
40. What is a myocardial infraction?  
*Loss of living heart muscle as a result of coronary occlusion*



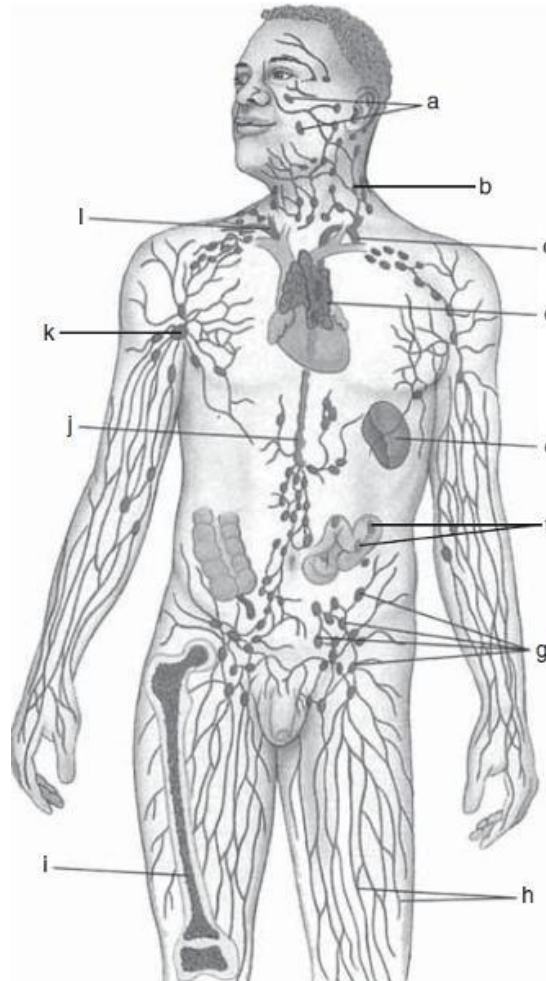
## STATION E



Give the letter from the diagram for each of the following parts of the Lymphatic System.

41. LYMPHATIC VESSELS
42. AXILLARY LYMPH NODES
43. INGUINAL LYMPH NODES
44. CERVICAL LYMPH NODES
45. THORACIC DUCT
46. RIGHT LYMPHATIC DUCT TONSILS
47. SPLEEN
48. THYMUS
49. PEYER'S PATCHES (IN INTESTINE)
50. TONSILS

## STATION E



Give the letter from the diagram for each of the following parts of the Lymphatic System.

- 41. LYMPHATIC VESSELS **H**
- 42. AXILLARY LYMPH NODES **K**
- 43. INGUINAL LYMPH NODES **G**
- 44. CERVICAL LYMPH NODES **B**
- 45. THORACIC DUCT **C**
- 46. RIGHT LYMPHATIC DUCT **L**
- 47. SPLEEN **E**
- 48. THYMUS **D**
- 49. PEYER'S PATCHES (IN INTESTINE) **F**
- 50. TONSILS **A**

## STATION F

51. Describe the mechanisms by which lymphatic fluid is moved through the lymphatics.

52. What is the consequence of obstruction of the lymphatics?

53. What is the special role of the thymus gland?

54. Name the tonsils and state their body locations.

55.-56. List the functions of the spleen.

57. Characterize lymph transport in terms of rate, volume, and ability to change.

58-59. How do the lymph capillaries differ from blood capillaries?

60. Explain the term MALT. What is its function?

## STATION F

51. Describe the mechanisms by which lymphatic fluid is moved through the lymphatics.

**Lymphatic fluid is moved through the lymphatics by the milking action of active skeletal muscles, pressure changes within the thorax during breathing, valves to prevent backflow, and pulsation of**

52. What is the consequence of obstruction of the lymphatics?

**Obstruction of the lymphatics results in edema distal to the obstruction adjacent arteries**

53. What is the special role of the thymus gland?

**By secreting hormones, the thymus gland causes T lymphocytes to become immunocompetent.**

54. Name the tonsils and state their body locations.

**Palatine tonsils are located on either side at the posterior end of the oral cavity. The lingual tonsils lie at the base of the tongue. The pharyngeal tonsils are in the posterior wall of the nasopharynx.**

55.-56. List the functions of the spleen.

**The spleen's main functions are to remove aged or defective blood cells and platelets from the blood and to store or release some of the breakdown products of RBCs to the blood for processing by the liver. Other functions include acting as a blood filter and reservoir, serving as a site for erythrocyte production in developing embryos, storing blood platelets, and providing a site for lymphocyte proliferation and immune surveillance and response.**

57. Characterize lymph transport in terms of rate, volume, and ability to change.

**Lymph transport is sporadic and much slower than that occurring in veins. About 3 liters of lymph enters the bloodstream in a 24-hour period. An increase in physical activity will cause lymph flow to increase, balancing the greater rate of fluid outflow from the vascular system.**

58-59. How do the lymph capillaries differ from blood capillaries?

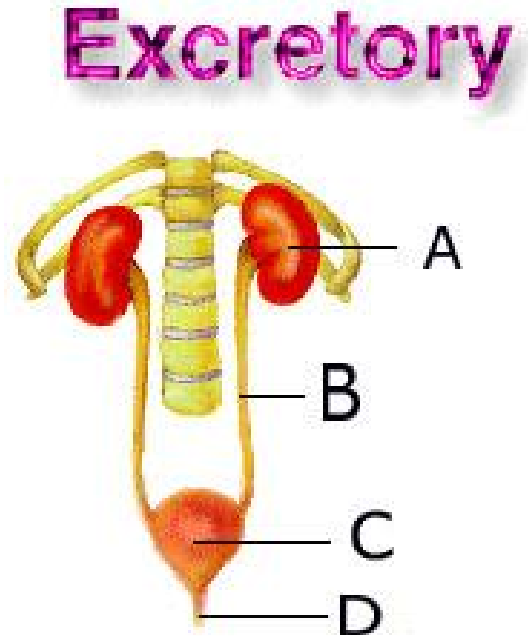
**Although similar to blood capillaries, lymphatic capillaries differ structurally in the following ways: (1) The endothelial cells forming the walls of lymphatic capillaries are not tightly joined. Their edges loosely overlap one another, forming flaplike minivalves. (2) Bundles of fine filaments anchor the endothelial cells to surrounding structures so that any increase in interstitial fluid volume separates the cell flaps, exposing gaps in the wall rather than causing the lymphatic capillary to collapse.**

60. Explain the term MALT. What is its function?

**MALT is an acronym for mucosa-associated lymphatic tissue. It includes Peyer's patches, the appendix, and the tonsils in the digestive tract, lymphoid follicles in the walls of the bronchi, and genitourinary tract. Collectively, MALT protects passages open to the exterior from foreign matter entering them.**

## Station G

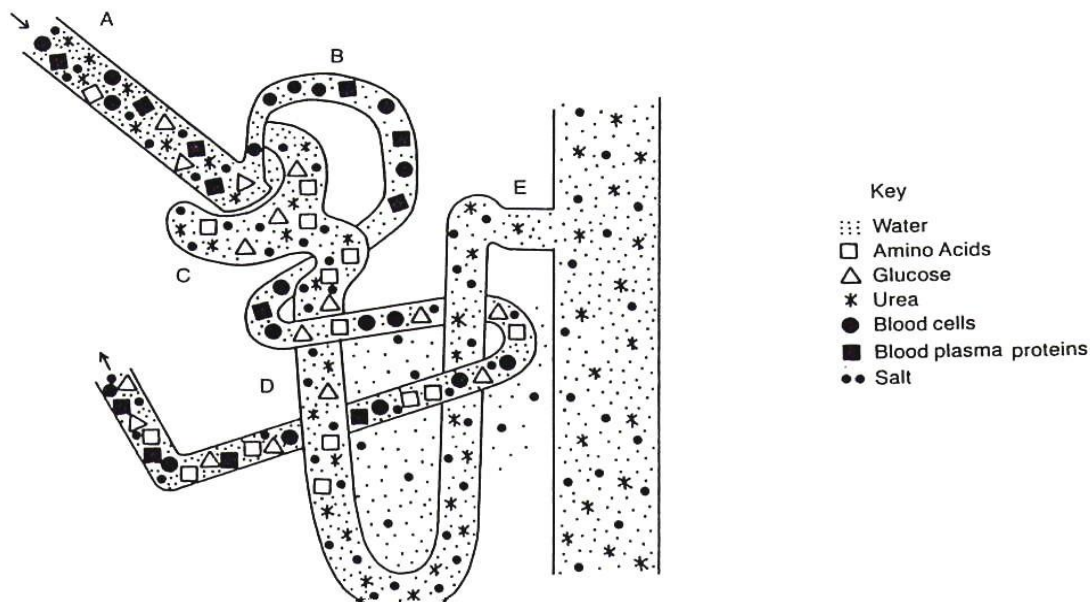
61. Give the name and function of the structure labeled D.
62. Give the name and function of the structure labeled C.
63. Give the name and function of the structure labeled B.
64. Give the name and function of the structure labeled A.
65. In which of the structures (A, B, C, D) in the above diagram are nephrons located?  
What are the three main jobs of the nephron?



For questions 51-54, use the diagram below

66. Using the diagram, explain what happens during the Filtration phase.
67. Using the diagram, explain what happens during the Reabsorption phase.
68. Using the diagram, explain what happens during the Secretion phase.
69. Which substances stayed in the blood?
70. The normal GFR rate is 125 mL/min, what would the normal rate be per hour expressed as liters/hour

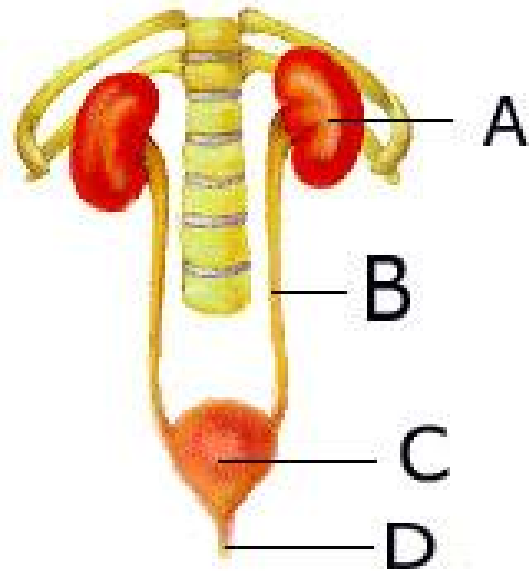
The diagram below represents blood entering and leaving a nephron. Area A shows the blood entering the kidney. Area B shows the blood after filtration. Area C shows the filtrate. Area D shows the blood after reabsorption. Area E shows the location of the formation of urine. Some of the contents of the blood and the filtrate are indicated in the key.



## Station G

# Excretory

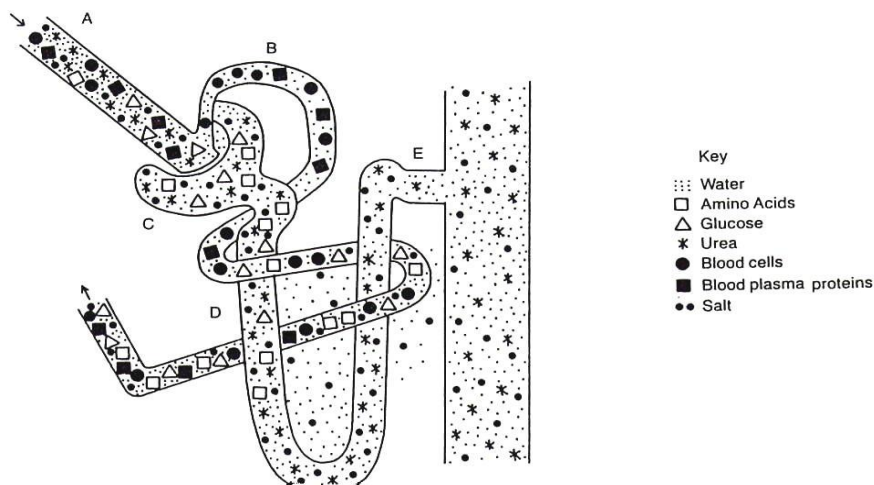
61. Give the name and function of the structure labeled D.  
**Urethra – releases urine from the body**
62. Give the name and function of the structure labeled C.  
**Bladder – stores urine**
63. Give the name and function of the structure labeled B.  
**Ureter – carries urine to the urinary bladder from kidney**
64. Give the name and function of the structure labeled A.  
**Kidney – filters blood and forms urine- receives 20-25 % of arterial blood**
65. In which of the structures (A, B, C, D) in the above diagram are nephrons located?  
 What are the three main jobs of the nephron?  
**A. 1. filtration 2. reabsorption 3. secretion**



For questions 51-54, use the diagram below

66. Using the diagram, explain what happens during the Filtration phase.  
**filtration – fluid pressure forces water and dissolved substances out of blood**
67. Using the diagram, explain what happens during the Reabsorption phase.  
**reabsorption – returns useful items as blood cells, plasma protein, glucose, amino acids, some salts and some water to the blood Some urea and other salts are also reabsorbed**
68. Using the diagram, explain what happens during the Secretion phase.  
**secretion involves active transport - removes residues from toxins drugs, more urea and uric acid into urine, excess potassium ions, and regulates pH of blood**
69. Which substances stayed in the blood?  
**Blood cells and Blood Plasma Proteins**
70. The normal GFR rate is 125 mL/min, what would the normal rate be per hour expressed as liters/hour  
**7.5 liters/hour**

The diagram below represents blood entering and leaving a nephron. Area A shows the blood entering the kidney. Area B shows the blood after filtration. Area C shows the filtrate. Area D shows the blood after reabsorption. Area E shows the location of the formation of urine. Some of the contents of the blood and the filtrate are indicated in the key.



## Station H

Match the diseases and abnormalities commonly associated with the urinary system with the most appropriate description:

- A. Incontinence
- B. Diabetes Insipidus
- C. Renal Ptosis
- D. Urinary Tract Infections
- E. Cystitis
- F. Renal Failure
- G. Nephrotic Syndrome (Nephritis)
- H. Glomerulonephritis (Bright's Disease)
- I. Kidney Stones
- M. BPH

- \_\_\_\_ 71. Inflammation of the bladder usually occurring secondary to ascending urinary tract infections.
- \_\_\_\_ 72. Polyuria and polydipsia caused by inadequate secretion of vasopressin (ADH) by the posterior pituitary gland (Neurohypophysis).
- \_\_\_\_ 73. A form of nephritis in which the lesions primarily involve the glomeruli.
- \_\_\_\_ 74. The inability to retain urine, feces, or semen through the loss of sphincter control or because of cerebral or spinal lesions.
- \_\_\_\_ 75. Calculus or crystalline masses present in the pelvis of the kidney composed primarily of urates, oxalates, phosphates, and carbonates of varying size.
- \_\_\_\_ 76. Inflammation of the kidney including the glomeruli, renal tubules, and interstitial tissue.
- \_\_\_\_ 77. Failure of the kidneys to perform their essential functions. Usually less than 10% of total kidney function.
- \_\_\_\_ 78. Dropping or drooping of the kidney from its normal position.
- \_\_\_\_ 79. Infection of the urinary tract (kidneys, ureters, bladder, urethra) by microorganisms.
- \_\_\_\_ 80. Enlarged prostate gland

Match the diseases and abnormalities commonly associated with the urinary system with the most appropriate description:

- A. Incontinence
- B. Diabetes Insipidus
- C. Renal Ptosis
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- E. Cystitis
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- H. Glomerulonephritis (Bright's Disease)
- I. Kidney Stones
- M. BPH

- E 71. Inflammation of the bladder usually occurring secondary to ascending urinary tract infections.
- B 72. Polyuria and polydipsia caused by inadequate secretion of vasopressin (ADH) by the posterior pituitary gland (Neurohypophysis).
- H 73. A form of nephritis in which the lesions primarily involve the glomeruli.
- A 74. The inability to retain urine, feces, or semen through the loss of sphincter control or because of cerebral or spinal lesions.
- I 75. Calculus or crystalline masses present in the pelvis of the kidney composed primarily of urates, oxalates, phosphates, and carbonates of varying size.
- G 76. Inflammation of the kidney including the glomeruli, renal tubules, and interstitial tissue.
- F 77. Failure of the kidneys to perform their essential functions. Usually less than 10% of total kidney function.
- C 78. Dropping or drooping of the kidney from its normal position.
- D 79. Infection of the urinary tract (kidneys, ureters, bladder, urethra) by microorganisms.
- M 80. Enlarged prostate gland