



11) Why do veins have valves? (1 point)

12) What is the basic chemical composition of urine (*give the percentages*)? (2 points)

13) T-cell receptors bind to antigens that are bound to cell membrane proteins. True / False (1 point)

14) Choose the cell that best matches the following description: Macrophages are one of its antigen presenting cells (APCs) (1 point)

- a) Cytotoxic T cells
- b) B cells
- c) Helper T cells
- d) Plasma cells

15) The heart has 2 pump circuits: the \_\_\_\_\_ circuit and the \_\_\_\_\_ circuit (2 points)

16) The definition of veins and arteries is based on the amount of oxygen found in them. True / False (1 point)

17) What is a myocardial infarction? (2 points)

18) Which 3 layers are present in both arteries and veins? (3 points)

19) Blood flows through the cardiovascular system because of the pressure caused by \_\_\_\_\_ (1 point)

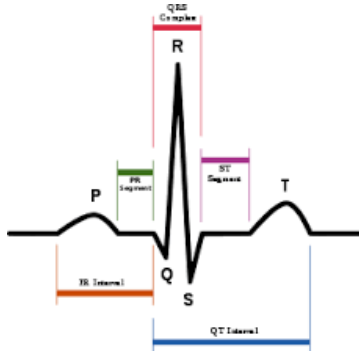
20) The record of spread of electrical activity through the heart is known as \_\_\_\_\_  
(1 point)

21) Briefly state the main function of the thymus gland: (1 point)

22) State and briefly describe the stages of urine formation (8 points; 2 each)

23) Name the components of blood. (3 points)

24) Answer the following questions based on the diagram below: (5 points)



- What happens during the P phase?
- What happens during the QRS phase?
- What happens during the T phase?
- What is passive filling?
- What happens during active filling?

25) Why is the mitral valve different from the other three valves of the heart? (1 point)

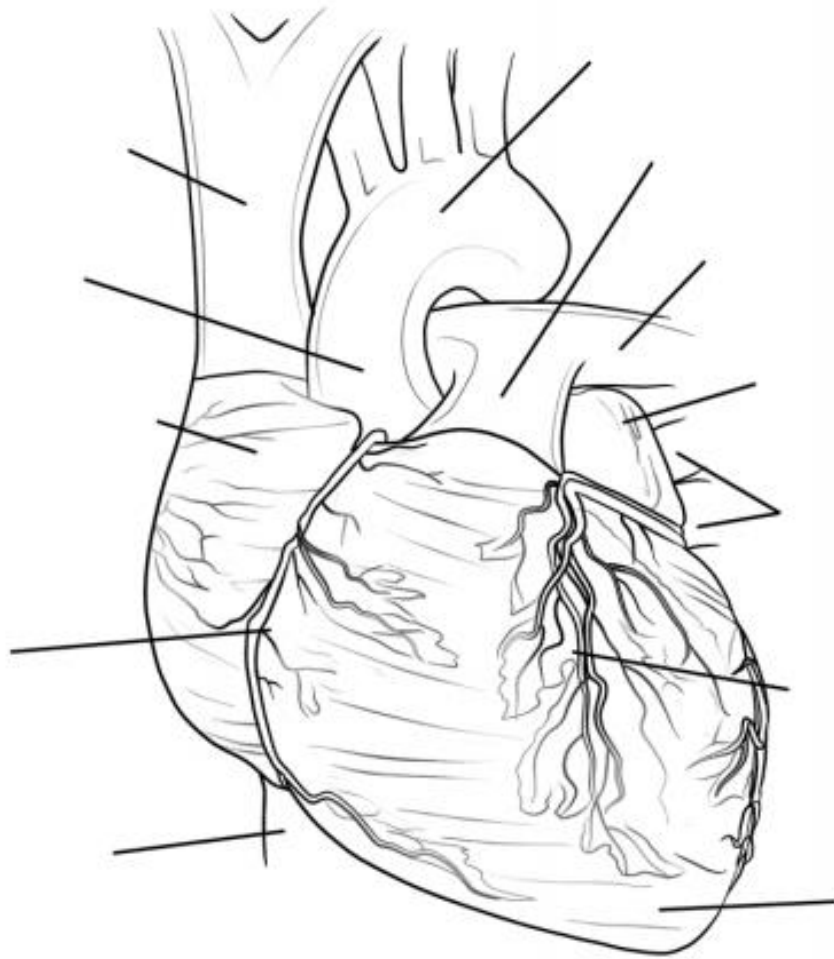
- It only has 1 flap
- It only has 2 flaps
- It only has 3 flaps

26) Which would be indicative of hypotension? (1 point)

- 120/80
- 170/125
- 80/64

27) Define lymphadenitis (1 point)

28) Label the below diagram as thoroughly as possible (12 points)



Superficial Heart Anatomy (Anterior)

Answer key:

- 1) 2 points each:
  - a) Filtration- movement of water and other solutes from plasma to renal tubules- 1 for "movement of water and other solutes". *Partial cr if only one of these is mentioned*
  - b) Reabsorption- the removing of water and useful solutes from the tubular fluid and returning those to the circulating blood.
  - c) Secretion - Opposite of reabsorption. Waste is removed through passive and active transport.
- 2) 20%-25%
- 3) Blood Flow: vena cava→ right atrium→tricuspid valve→ right ventricle→ pulmonary valve→pulmonary artery→pulmonary capillary bed→pulmonary veins→left atrium→bicuspid (mitral valve)→ left ventricle→ aortic valve →aorta→arteries→ arterioles→tissue→capillaries→venules→ veins→ vena cava
- 4) 7.5L/hr
- 5) Nonspecific and Specific
- 6) Wall of the small intestine
- 7) Humoral
- 8) 16oz
- 9) 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.
- 10) 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.
- 11) To prevent the backflow of blood
- 12) 95% water, 5% solutes
- 13) True
- 14) C
- 15) Pulmonary; Systemic (*or vice-versa*)
- 16) False
- 17) The death of cells which follows cessation/stoppage of blood flow
- 18) Endothelium, Smooth muscle and collagen fibers
- 19) Contraction of heart/ heart's contraction (*or any variation of this answer*)
- 20) Electrocardiogram/ECG/EKG
- 21) Differentiation and maturation of T cells
- 22) 4 stages ( 2 points each)
  - a) Glomerular filtration into Bowman's capsule
  - b) Solute reabsorption from the proximal tubule to capillary
  - c) Water reabsorption from the proximal tubule and Loop of Henle to capillary
  - d) Tubular Secretion from the capillary to the distal tubule
- 23) 3 components (+1 **tie breaker**):

- a) Red blood cells/RBCs/erythrocytes
- b) White blood cells/WBCs/leukocytes
- c) Platelets/thrombocytes
- d) Tie breaker point: Plasma**

24) 5 points

- a) P = atria contract (depolarization)- Marks the beginning of atrial systole
- b) QRS = atria relaxes (repolarization) as ventricles contract (depolarization)  
Beginning of ventricular systole
- c) T = ventricles relax (repolarization) Marks the end of ventricular systole.
- d) Ventricles are in diastole. Atria are in diastole AV valves are open  
Semilunar valves are closed
- e) Ventricles are in diastole Atria are in systole AV valves are open  
Semilunar valves are closed

25) B

26) C

27) inflammation of the lymph nodes

28)

