1. Structure of the Heart

a. Write the correct labels in the spaces at the right.

1) ____________________________________________
2) ____________________________________________
3) ____________________________________________
4) ____________________________________________
5) ____________________________________________
6) ____________________________________________
7) ____________________________________________
8) ____________________________________________
9) ____________________________________________
10) __________________________________________
11) __________________________________________
12) __________________________________________
13) __________________________________________
14) __________________________________________
15) __________________________________________
16) __________________________________________
17) __________________________________________
18) __________________________________________

b. Write the answers that match the statements in the spaces at the right.

1) Receives blood from venae cavae.
   - Right atrium
   - Left atrium
   - Inferior vena cava
   - Superior vena cava
   - Aorta
   - Pulmonary trunk
   - Pulmonary semilunar valve
   - Mitral (bicuspid) valve
   - Bicuspid valve
   - Aortic semilunar valve
   - Pulmonary semilunar valve
   - Tricuspid valve
   - Chordae tendineae
   - Right ventricle

2) Receives blood from pulmonary veins.
   - Left atrium
   - Left pulmonary veins
   - Left pulmonary artery
   - Pulmonary trunk
   - Pulmonary semilunar valve
   - Mitral (bicuspid) valve
   - Bicuspid valve
   - Aortic semilunar valve
   - Pulmonary semilunar valve
   - Tricuspid valve
   - Chordae tendineae
   - Right ventricle

3) Separates ventricles.
   - Septum
   - Ventricle septum
   - Ventricular septum

4) Prevents backflow of blood from right ventricle into right atrium.
   - Right atrium
   - Left atrium
   - Ventricle septum
   - Tricuspid valve
   - Bicuspid valve
   - Aortic semilunar valve
   - Pulmonary semilunar valve

5) Prevents backflow of blood from left ventricle into left atrium.
   - Right atrium
   - Left atrium
   - Ventricle septum
   - Tricuspid valve
   - Bicuspid valve
   - Aortic semilunar valve
   - Pulmonary semilunar valve
   - Chordae tendineae

6) Prevents backflow of blood from aorta into left ventricle.
   - Right atrium
   - Left atrium
   - Ventricle septum
   - Tricuspid valve
   - Bicuspid valve
   - Aortic semilunar valve
   - Pulmonary semilunar valve
   - Chordae tendineae

7) Prevents backflow of blood from pulmonary trunk into right ventricle.
   - Right atrium
   - Left atrium
   - Ventricle septum
   - Tricuspid valve
   - Bicuspid valve
   - Aortic semilunar valve
   - Pulmonary semilunar valve

8) Restrain cusps of A-V valves.
   - Papillary muscle
   - Tricuspid valve
   - Bicuspid valve
   - Aortic semilunar valve
   - Pulmonary semilunar valve
   - Chordae tendineae

9) Pumps blood into pulmonary trunk.
   - Left ventricle
   - Right ventricle
   - Pulmonary trunk
   - Pulmonary semilunar valve
   - Tricuspid valve
   - Bicuspid valve

10) Pumps blood into aorta.
    - Right ventricle
    - Aorta
    - Mitral (bicuspid) valve
    - Aortic semilunar valve
    - Tricuspid valve
2. Cardiac Cycle

Write the answers that match the statements in the spaces at the right.

1) Contraction phase of the ventricles.               Ventricular systole
2) Relaxation phase of the ventricles.               Ventricular diastole
3) Valves closing to produce first heart sound.     AV valves
4) Valves closing to produce second heart sound.    Semilunar valves
5) Valves open during ventricular systole.          AV valves
6) Valves closed during ventricular systole.         AV valves
7) Valves open during ventricular diastole.          Semilunar valves
8) Valves closed during ventricular diastole.

3. Heart Conduction System and Electrocardiogram

Write the answers that match the statements in the spaces at the right.

1) Small fibers carrying impulses to myocardium.     Purkinje fibers
2) Pacemaker of the heart.                          S-A node
3) Thick fibers extending from A-V node.            A-V bundle
4) Transmits impulses to atria and A-V node.        S-A node
5) Transmits impulses to A-V bundle.                A-V node
6) Wave caused by depolarization of ventricles.     QRS wave
7) Wave caused by repolarization of ventricles.     T wave
8) Wave caused by depolarization of atria.          P wave

4. Regulation of Heart Rate

a. Write the answers that match the statements in the spaces at the right.

   1) Autonomic center controlling heart rate.        Cardiac control center
   2) ANS division whose impulses increase heart rate. Sympathetic
   3) ANS division whose impulses decrease heart rate. Parasympathetic
   4) Gender with faster heart rate.                  Female
   5) Nerve carrying parasympathetic fibers to the heart. Vagus nerve

b. Match the effect on heart rate with the factors listed.

   1) Increases                           2) Decreases                        3) No effect
      1. Epinephrine                     2. Excess K⁺                         2. Insufficient Ca⁺⁺
      2. Old age                        2. Acetylcholine                     1. Excitement
      1. Fever                          1. Anxiety                          1. Thyroxine
      2. Physical conditioning          3. Increase in blood pressure       1. Norepinephrine

5. Types of Blood Vessels

Write the answers that match the statements in the spaces at the right.

1) Composed of endothelium only.                    Capillaries
2) Vessels with thickest walls.                     Arteries
3) Vessels with valves.                             Veins
4) Carry blood from capillaries to heart.           Veins
5) Carry blood from heart to capillaries.           Arteries
6) Vessels exchanging materials with tissues.      Capillaries
7) Smallest and most numerous vessels.             Capillaries

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6. Blood Flow and Blood Pressure

a. Write the answers that match the statements in the spaces at the right.

1) Systemic vessel with fastest blood flow. ____________
2) Vessels with slowest blood flow. ____________
3) Systemic vessel with greatest blood pressure. ____________
4) Primary force moving blood. ____________
5) Two additional forces that help return venous blood to the heart. ____________
6) Normal systolic blood pressure. ____________
7) Normal diastolic blood pressure. ____________
8) Autonomic center controlling diameter of blood vessels. ____________
9) Systolic pressure minus diastolic pressure. ____________
10) Effect on precapillary sphincters by a local decrease in oxygen and pH. ____________
11) Effect on precapillary sphincters by sympathetic impulses. ____________

b. Indicate whether the following conditions cause an increase (+) or decrease (−) in blood pressure.

+ An increase in peripheral resistance.
− A marked decrease in blood volume.
− A decrease in cardiac output.
− Dilation of a great many arterioles.
+ A significant increase in plasma proteins.
+ Sympathetic impulses to arterioles.
+ Constriction of most arterioles.
+ An increase in heart rate.

7. Circulation Pathways

Trace the pathway of blood from a ventricle of the heart to the organ indicated and back to an atrium of the heart. Write the names of the correct heart chambers, arteries, and veins in the blanks.

1) Right little finger.

Left ventricle → ____________ → ____________ → ____________ → ____________ → ____________ → ____________ → ____________ → ____________ → right little finger

2) Small intestine.

Left ventricle → ____________ → ____________ → ____________ → ____________ → ____________ → ____________ → ____________ → right atrium.
8. Systemic Arteries

Label the figure by writing the names of the numbered arteries in the spaces.

1) Subclavian
2) Axillary
3) Brachial
4) Radial
5) Ulnar
6) External iliac
7) Deep femoral
8) Femoral
9) Popliteal
10) Anterior tibial
11) Posterior tibial
12) Fibular
13) Dorsal pedis
14) Internal carotid
15) External carotid
16) Left common carotid
17) Brachiocephalic
18) Aortic arch
19) Pulmonary trunk
20) Left coronary
21) Right coronary
22) Thoracic aorta
23) Splenic
24) Celiac trunk
25) Renal
26) Superior mesenteric
27) Abdominal aorta
28) Interior mesenteric
29) Common iliac
30) Internal iliac
9. Systemic Veins

Label the figure by writing the names of the numbered veins in the spaces.

1) **Subclavian**
2) **Cephalic**
3) **Axillary**
4) **Basilic**
5) **Median cubital**
6) **External iliac**
7) **Femoral**
8) **Great saphenous**
9) **Popliteal**
10) **Posterior tibial**
11) **Anterior tibial**
12) **Small saphenous**
13) **Internal jugular**
14) **External jugular**
15) **Left brachiocephalic**
16) **Superior vena cava**
17) **Right pulmonary**
18) **Grat cardiac**
19) **Small cardiac**
20) **Inferior vena cava**
21) **Hepatic**
22) **Splen ic**
23) **Hepatic portal**
24) **Superior mesenteric**
25) **Inferior mesenteric**
26) **Left common iliac**
27) **Internal iliac**
10. Disorders of the Heart and Blood Vessels

Write the disorders described by the statements in the spaces at the right.

1) Unusual heart sounds. _______________________ Heart murmur
2) Hardening of the arteries. ___________________ Arteriosclerosis
3) Death of a portion of the myocardium. _______ Myocardial infarction
4) Abnormal heart rhythm. ____________________ Arrhythmia
5) Inflammation of a vein. _____________________ Phlebitis
6) Chronic high blood pressure. _______________ Hypertension
7) Swollen veins due to defective valves. _______ Varicose veins
8) Balloonlike enlargement of blood vessel. _____ Aneurysm
9) Fatty deposits in walls of arteries. ___________ Atherosclerosis
10) Edema of lungs, viscera, legs, and feet. ____ Congestive heart failure

11. Clinical Applications

a. A 60-year-old man complains of chest pain during moderate exercise. The pain goes away after he rests for a while. What is the likely cause of the pain? A partially blocked coronary artery. 
Without treatment, what complications may arise? He may have a heart attack.

b. An accident victim has lost considerable blood. His blood pressure is only slightly below normal, and his pulse rate is elevated. How is the body compensating for the loss of blood? The lost blood has been replaced by the reserve blood supply in the spleen.

c. A patient has a blood clot in the right femoral vein. If a part of the clot should break loose, where is it likely to lodge? In a pulmonary artery.
Would this be a serious complication? Yes Explain. If blood flow to the lungs is mostly blocked, oxygenation of blood is drastically reduced which may cause death.