1. List functions of the cardiovascular system.

__________________________________________________________________________

2. What types of fluid are involved in exchange? ____________________________________

3. Arteries take blood ______________ the heart.
Veins take blood ______________ the heart.

4. What tissues are found in the 3 layers of large arteries and veins?
   Tunica interna/intima _______________________________________________________
   Tunica media ___________________________________________________________________
   Tunica externa/adventitia _____________________________________________________

5. ______________ are capillary beds that bring oxygen and nutrients to large vessels.

6. Arteries have ______ smooth muscle and ______ elastic tissue than veins. (more or less)
   Why? _______________________________________________________________________

7. Why are veins larger? ____________________________________________________________________

8. ______________ arteries are near the heart and expand and contract to propel blood.
   ______________ arteries adjust the rate of blood flow through the vessels by
   ________________ and ________________.

9. ______________ are small arteries that have lost the tunica externa, and only consist of
   endothelium and muscle.

10. ______________ are involved in exchange of fluids, gases and nutrients. They only
    consist of the tunica _____________.
    Some of these are ____________________; they allow more molecules to be exchanged.

11. ______________ are small veins that have 2 layers (_____________ and _______________)
    and very little muscle.

12. Medium and large veins have ________ layers.

13. Veins have ________________ that aid movement of blood back to the heart.
    What else helps move blood through veins? _______________________________________

14. The majority of blood (64%) is found in what part of the cardiovascular system? _________

15. Capillaries have an ________________ end and a ________________ end, with more
    pressure on the ________________ side.

16. ________________ are small bundles of muscle that shunt blood.

17. A ________________ and ________________ shunt blood directly from the
    arterial side to the venule side, allowing blood to bypass the capillary network.
18. An _______________________________ is a direct connection between arterioles and venules.

19. A large vessel has a _______________ (larger or smaller) total cross-sectional area.
   Small vessels, such as the capillaries have a _______________ (larger or smaller) total cross-sectional area.

20. Blood pressure is highest in the ___________________ and decreases to almost 0 in the _______________.

21. Velocity of blood flow is fastest in ________________ and slowest in ________________. It speeds up a little in the ________________.

22. ___________________________ is the pressure in a vessel due to the blood flowing through it.

23. systolic pressure - diastolic pressure = ____________________.

24. diastolic pressure + 1/3 pulse pressure = ____________________.

25. ___________________________ opposes hydrostatic pressure.

26. As resistance increases, pressure ____________________.

26. As resistance increases, flow of blood ____________________.

27. As pressure gradient increases, flow of blood ____________________.

28. List 4 things that will increase resistance. _____________________________________
   ______________________________________________________________________

29. Define laminar flow ______________________________________________________
    Define turbulence _______________________________________________________
    Larger vessels have more __________________ while smaller vessels have more ________________.

30. Increased blood volume results in ________________ pressure.
    The large capacity in the venous system ____________________ pressure.

31. ________________ increases capacitance and decreases pressure.
    ________________ increases pressure and decreases capacitance.
1. exchange of fluids, nutrients, gases, hormones; waste and toxin removal
2. extracellular and interstitial
3. arteries - away from; veins - toward
4. tunica interna/intima - epithelium (endothelium)
   tunica media - smooth muscle and elastic tissue
   tunica externa/adventitia - collagen
5. vasa vasorum
6. more smooth muscle because it sends blood a long distance;
   more elastic tissue to expand to handle pressure out of heart and propel blood
7. capacitance vessels - carry more blood than any other vessel type
8. elastic; muscular; vasoconstriction; vasodilation
9. arterioles
10. capillaries; interna/intima; fenestrated (less selective based on molecule size)
11. venules; externa and endothelium
12. 3
13. valves; muscular and respiratory pumps
14. veins
15. arterial; venous; arterial
16. precapillary sphincters
17. metarteriole; thoroughfare
18. arteriovenous anastomosis
19. smaller; larger
20. elastic arteries; venae cavae
21. arteries; capillaries; veins
22. hydrostatic pressure
23. pulse pressure
24. mean arterial pressure
25. resistance
26. decreases
27. increases
28. viscosity of blood (thicker), increased length of vessels, smaller diameter of vessels, plaque
29. laminar flow - less resistance to flow in the middle of a vessel than at the walls;
   turbulence - resistance to flow due to irregular surfaces in vessels;
   larger - laminar flow; smaller - turbulence
30. increased; decreases
31. vasodilation; vasoconstriction