Heart and Lung

Problem Set A: Cardiovascular Topics



1. Draw a diagram with trendlines showing changes in pressure, velocity, and cross-sectional area throughout the vascular system. In addition, draw the wall anatomies comparing veins to arteries.

	b. c. d. e. f. g. h.	Systole Diastole Preload Afterload Total peripheral resistance Central venous pressure Cardiac output Stroke volume Ejection fraction
3.	a. b. c. d.	Define compliance. Define compliance. What does high compliance suggest? What types of vessels have greater compliance? What is their purpose? What are the age-related changes to compliance? What is the effect of chronic hypertension on arterial vessels?
4.	Give t	wo examples of effects that elastic properties have on blood vessels.
5.		ding the electrical activity of the heart, define and differentiate automaticity sythmicity.

2. Define the following terms:

6.	Draw graphs with mV on the y-axis and time on the x-axis that show the
	ventricular, atrial, and SA node action potentials. Make sure to label the phases
	0-4 as appropriate for each type.

7. Briefly describe the ion movements occurring during phases 0-4.

8.	Write the primary effects of alpha and beta adrenergic receptors.
9.	Describe the actions of norepinephrine, epinephrine, and acetylcholine on the sympathetic and parasympathetic divisions of the cardiac system.
10.	Draw and label an EKG wave. What do the P wave, QRS complex, and T wave represent?
11.	What is the Einthoven Triangle? Where are the three ground electrodes located? What direction does the vector normally point to?

- 12. Define the following terms:
 - a. Arrhythmia-
 - b. Bradycardia-
 - c. Tachycardia- heart beats too fast
 - d. Atrial fibrillation-
 - e. Ventricular fibrillation-
- 13. Describe all the steps of the cardiac cycle. Correlate each step with chamber contractions, valve openings, pressures, heart sounds, and the part of the EKG.

14. Draw a graph with systolic and diastolic trendlines pertaining to the Frank-Starling Law.
15. Compare active and reactive hyperemia.
16. What is the Bohr effect? Draw the oxygen binding curves for myoglobin and hemoglobin.