BIOLOGY 11 – PRE-LAB EXERCISE

8	Name: Answer Key	5
	Lab Day & Time:	

Features of the Cardiovascular System

1. Read the "**Pulse-Rate Method**" in section **8.3 Heartbeat** of your ***Lab Manual***.
On at least two different mornings, take your **resting pulse rate**, before you get out of bed in the morning, and before you engage in any activity or are disturbed. Record **your** daily resting heart rate and the average.

Day 1: **Day 2:** **Average Resting Pulse Rate =** **beats per minute**

Average for a healthy young adult = 60–80 bpm.

2. Computation of your target heart rate.

In order to improve and maintain the health of your cardiovascular system (i.e., to increase your stamina and to reduce the risks of heart disease, strokes, diabetes, and impaired circulation), it is generally recommended that you engage in aerobic exercise for at least twenty minutes, 3–4 times per week. During these exercise sessions, you should sustain a **target heart rate** that takes into account your age and the current condition of your heart. [Consult your physician before starting any radically new exercise regime!]

Let's assume here a normal, healthy 21-year-old!

Calculate ***your*** personal target heart rate, following these steps:

a. Begin with 220 points (a figure determined by statistics) 220 .

b. Age (for ages 1-20, use 20; for ages over 20 use your exact age) 21

c. Prediction of maximum heart rate (subtract b from a). 199

d. Resting Pulse Rate (per minute)
(rate taken when you first wake up in the morning — from question #1 above). 70

e. Working Heart Rate (per minute) (subtract d from c) 129

f. Safe Percentage of line e
(under age 40, use 70% of line e; over age 40, use 65% of line e) 90

g. **Target Heart Rate** (per minute) (add d and f) 160

h. Since during exercise it is most practical to measure your pulse over just 10 seconds, what is your **Target Heart Rate per 10 seconds** (Divide g by 6. Round to whole number.) 27

3. What exactly is meant by "pulse" and why can you feel it? A wave of pressure starting in the heart when the left ventricle contracts, and traveling down the large arteries. The pressure wave bulges the walls of the artery and these bulges can be felt as they pass a given point.

4. In the "**Stethoscope Method**" in section **8.3 Heartbeat**, what specifically causes the heart sounds?
The first sound, "lub", is caused by vibrations from the AV valves closing at the start of ventricular systole.
The second sound, "dup", is caused by vibrations from the SL valves closing at the end of ventricular systole.

What is the purpose of heart valves? To regulate blood flow in one direction through the heart and into the arteries.

5. Define "blood pressure" in your own words. The maximum and minimum pressure of the fluid in the large arteries caused by blood ejected by contractions of the heart.

Define "systolic pressure". Is this the higher or lower number? The maximum pressure (higher number) occurring in the arteries during ventricular contraction (systole).

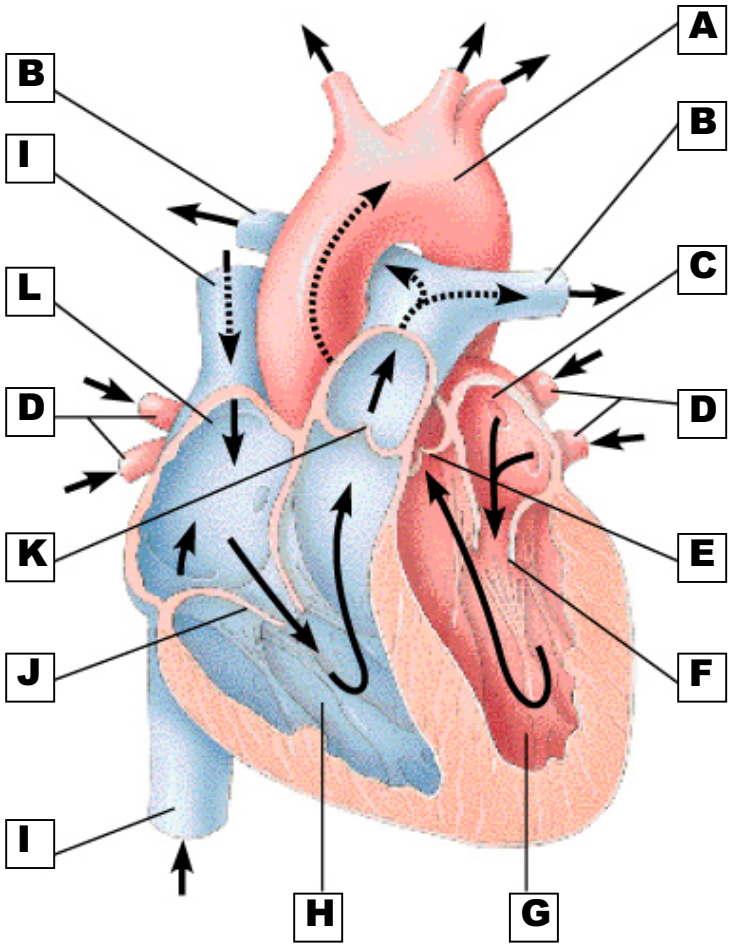
Define "diastolic pressure". Is this the higher or lower number? The minimum pressure (lower number) occurring in the arteries during ventricular relaxation (diastole).

Compare this illustration with the two drawings in **Figures 8.3 & 8.4** of your ***Lab Manual***.

6. In the blanks to the left of the list of terms, write the **letter** that matches that term with the indicated part of the heart in the illustration. (Hint: parts with the same letter have the same name.)

Letter from picture	Heart anatomy	Sequence number
A	**Aorta**	12
C	Left **Atrium**	8
L	Right **Atrium**	2
F	Left **AV valve**	9
J	Right **AV valve**	3
B	**Pulmonary artery**	6
D	**Pulmonary veins**	7
E	Left **Semilunar valve**	11
K	Right **Semilunar valve**	5
I	**Vena cava**	1
G	Left **Ventricle**	10
H	Right **Ventricle**	4

7. Trace the path of blood flow as it returns to the heart from the body; then is pumped to the lungs, back to the heart, and back to the general systemic circulation.
In the blanks to the right of the list of terms, write the **number** that matches that part of the heart in the **order of sequence** as the blood flows through each part.



8. Which chamber of the heart is the most muscular? Why?
Left ventricle — because it needs to generate the most force of contraction to propel the blood the farthest distance (systemic circulation).

9. Name the two arteries that directly lead away from the heart. Pulmonary artery & aorta

Which of these two arteries carries oxygenated blood? Aorta

10. Name the two groups of veins that directly lead into the heart. Vena cavae & pulmonary veins

Which of these two groups of veins carries oxygenated blood? Pulmonary veins

11. As the blood flows through the atria and ventricles, does it nourish the muscle of the heart? No.

How does the heart muscle get the oxygen and nutrients it needs for the respiration to power its contractions?
Coronary arteries branch off of the aorta leading to capillary beds in the walls of the heart.