The Heart - Worksheets

1. What is the name of the central region of the thorax? ___

2. About how much of the heart is to the left of the mid-sternal line? __________

3. Where is the location of the apex of the heart? ______________

**Figure 23.1**

4. In reference to Figure 23.1, identify #1 - #5.
   1 ______________________  4 _____________________
   2 ______________________  5 _____________________
   3 ______________________

**COVERINGS OF THE HEART**

5. What is the name of the covering of the heart? ______________

6. What is the function of the fibrous layer of the pericardium? __________

7. What is the name of the inner layer of the pericardium? __________

8. What is the name of the serous membrane on the surface of the heart? __________

9. What forms the pericardial cavity? __________

10. What is the function of the serous membrane? __________

**Figure 23.2**

11. In reference to Figure 23.2, identify #1 - #3.
    1 ______________________  3 ______________________
    2 ______________________

**GROSS ANATOMY OF THE HEART**

12. In reference to Figure 23.3, identify #1 - #4.
    1 ______________________  3 ______________________
    2 ______________________  4 ______________________

**Valves of the Heart**

13. Where are the atroioventricular valves located? __________

14. What are the names of the right and the left atrioventricular valves? __________

15. What is the function of the atrioventricular valves? __________

16. What is the name of the exiting vessel from the right ventricle? __________

17. What is the name of the exiting vessel from the left ventricle? __________

18. What is the name of the valve located at the base of each exiting vessel? __________
27 What is the function of the aortic and pulmonary valves?

28 In reference to Figure 23.4, identify #1 - #16.

1 ______________________  9 _____________________
2 ______________________  10 ____________________
3 ______________________  11 ____________________
4 ______________________  12 ____________________
5 ______________________  13 ____________________
6 ______________________  14 ____________________
7 ______________________  15 ____________________
8 ______________________  16 ____________________

29 In reference to Figure 23.5, identify #1 - #14.

1 ______________________  8 _____________________
2 ______________________  9 _____________________
3 ______________________  10 ____________________
4 ______________________  11 ____________________
5 ______________________  12 ____________________
6 ______________________  13 ____________________
7 ______________________  14 ____________________

30 In reference to Figure 23.6, identify #1 - #20.

1 ______________________  11 ____________________
2 ______________________  12 ____________________
3 ______________________  13 ____________________
4 ______________________  14 ____________________
5 ______________________  15 ____________________
6 ______________________  16 ____________________
7 ______________________  17 ____________________
8 ______________________  18 ____________________
9 ______________________  19 ____________________
10 ______________________ 20 ____________________

31 The right atrium receives blood from ______________________
32 The superior vena cava returns blood from the ______________________
33 The inferior vena cava returns blood from the ______________________
34 The coronary sinus returns blood from the ______________________
35 What is the function of the tricuspid valve? ______________________
36 What is the function of the right ventricle? ______________________
37 What is the function of the pulmonary valve? ______________________
What is the function of the pulmonary trunk? _________

The left atrium receives blood from ________________________

The pulmonary veins carry ________________________

What is the function of the mitral (bicuspid) valve? _________

What is the function of the left ventricle? ________________________

What is the function of the aortic (semilunar) valve? _________

What vessel exits the heart to feed the systemic circuit? _________

What is the ligamentum arteriosum? ________________________

What are the chordae tendineae? ________________________

What are the papillary muscles? ________________________

ROUTE OF BLOOD FLOW THROUGH THE HEART

Right Side of the Heart

Blood low in oxygen enters the right _____ from the ______ and ______ cavae and the ____________.

Blood leaves the right atrium by way of the ___________________ and enters the ____________.

Blood leaves the ______ by way of the ____________ valve and enters the ____________ trunk.

The pulmonary trunk directs blood into the ____________ of the lungs for gas exchange.

Left Side of the Heart

Oxygen rich blood enters the left _____ from the ____________ veins.

Blood leaves the left atrium by way of the ____________ valve and enters the left ____________.

Blood leaves the left ventricle by way of the _______ and enters the ____________.

The aorta directs blood into the ____________ of the body.

CORONARY CIRCULATION

CORONARY ARTERIES

Oxygen rich blood leaves the aorta and enters the two coronary arteries, the ____________ arteries.

What are the aortic sinuses? ________________________

Which sinuses give rise to the coronary arteries? _________
Chapter 23 - The Heart

**Figure 23.9**

61 In reference to Figure 23.9, identify #1 - #6.
1 ______________________  4 _____________________
2 ______________________  5 _____________________
3 ______________________  6 _____________________

**Right Coronary Artery**

62 The right coronary artery follows the right ____________ sulcus to the posterior ____________ sulcus.
63 At the posterior interventricular sulcus, the right coronary artery continues as the _____________.
64 At the margin of the right ventricle, a branch called the right ______________ artery is formed from the right coronary artery.

**Left coronary artery**

65 The left coronary artery branches into the ____________ artery and the ____________.

**Figure 23.10**

66 In reference to Figure 23.10, identify #1 - #6.
1 ______________________  4 _____________________
2 ______________________  5 _____________________
3 ______________________  6 _____________________

**Coronary Veins**

67 The three major veins that enter the coronary sinus are the:

68 What is the coronary sinus?

**Figure 23.11**

69 In reference to Figure 23.11, identify #1 - #4.
1 ______________________  3 _____________________
2 ______________________  4 _____________________

**Figure 23.12**

70 In reference to Figure 23.12, identify #1 - #4.
1 ______________________  3 _____________________
2 ______________________  4 _____________________
SHEEP HEART DISSECTION

Figure 23.13
71 In reference to Figure 23.13, identify #1 - #4.
1 ______________________  3 _____________________
2 ______________________  4 _____________________

Figure 23.14
72 In reference to Figure 23.14, identify #1 - #17.
1 ______________________  10 ____________________
2 ______________________  11 ____________________
3 ______________________  12 ____________________
4 ______________________  13 ____________________
5 ______________________  14 ____________________
6 ______________________  15 ____________________
7 ______________________  16 ____________________
8 ______________________  17 ____________________
9 ______________________

Figure 23.15
73 In reference to Figure 23.15, identify #1 - #10.
1 ______________________  6 _____________________
2 ______________________  7 _____________________
3 ______________________  8 _____________________
4 ______________________  9 _____________________
5 ______________________ 10 ____________________

Figure 23.16
74 In reference to Figure 23.16, identify #1 - #14.
1 ______________________  8 _____________________
2 ______________________  9 _____________________
3 ______________________ 10 ____________________
4 ______________________ 11 ____________________
5 ______________________ 12 ____________________
6 ______________________ 13 ____________________
7 ______________________ 14 ____________________
Figure 23.17
76 In reference to Figure 23.17, identify #1 - #10.
1 ______________________ 6 ______________________
2 ______________________ 7 ______________________
3 ______________________ 8 ______________________
4 ______________________ 9 ______________________
5 ______________________ 10 ______________________

Pericardial sac, Epicardium, and Endocardium

76 What is the pericardium? __________________________
77 What is the inner layer of the pericardium? __________
78 What is the epicardium? __________________________
79 What is the myocardium? _________________________
80 What is the endocardium? _________________________
81 Internally, what does the interventricular sulcus follow? __
82 Which side of the heart is more muscular? __________
   Why? ________________________________________

Figure 23.18
91 In reference to Figure 23.18, identify #1 - #16.
1 ______________________ 9 ______________________
2 ______________________ 10 ______________________
3 ______________________ 11 ______________________
4 ______________________ 12 ______________________
5 ______________________ 13 ______________________
6 ______________________ 14 ______________________
7 ______________________ 15 ______________________
8 ______________________ 16 ______________________

Blood vessels associated with the heart

83 Do arteries or veins have thicker walls? _________ Why?

84 What is the function of the superior and inferior vena cavae? ________________________________
85 Where is the pulmonary trunk located? __________________________
86 What is the function of the pulmonary trunk? __________________________
87 Where are the pulmonary veins located? __________________________
88 What is the function of the pulmonary veins? __________________________
89 Where is the aorta located? __________________________
90 What is the function of the aorta? __________________________
In reference to Figure 23.19, identify #1 - #16.
1 ______________________  9 _____________________
2 ______________________  10 ____________________
3 ______________________  11 ____________________
4 ______________________  12 ____________________
5 ______________________  13 ____________________
6 ______________________  14 ____________________
7 ______________________  15 ____________________
8 ______________________  16 ____________________

92 **DISSECTION OF RIGHT SIDE OF HEART**

In reference to Figure 23.20, identify #1 - #9.
1 ______________________  6 _____________________
2 ______________________  7 _____________________
3 ______________________  8 _____________________
4 ______________________  9 _____________________
5 ______________________

93 **Figure 23.20**

94 In reference to Figure 23.21, identify #1 - #11.
1 ______________________  7 _____________________
2 ______________________  8 _____________________
3 ______________________  9 _____________________
4 ______________________  10 ____________________
5 ______________________  11 ____________________
6 ______________________

95 What is attached to the free-edges of the cusps of the tricuspid valve?
______________________________________________

96 The chordae tendineae attached to the myocardium at modified sites called _________________ muscles.

97 When does the tricuspid valve close? ________________
______________________________________________

98 What prevents the cusps from moving into the atrium? __________
______________________________________________
______________________________________________

99 What is the function of the moderator band? ___________
______________________________________________

100 Where is the pulmonary (semilunar) valve located? _____
______________________________________________

101 When does the pulmonary (semilunar) valve open? _____
______________________________________________

102 What is the function of the pulmonary valve? __________
______________________________________________

103 When does the pulmonary valve close? _______________
______________________________________________

104 Where is blood in the pulmonary trunk directed? _______
______________________________________________
______________________________________________
Chapter 23 - The Heart

**Dissection of the Left Side of Heart**

**Figure 23.22**

105 In reference to Figure 23.22, identify #1 - #8.

1 ______________________  5 _____________________
2 ______________________  6 _____________________
3 ______________________  7 _____________________
4 ______________________  8 _____________________

106 What is attached to the free-edges of the cusps of the bicuspid valve?

107 The chordae tendineae attached to the myocardium at modified sites called _________________ muscles.

108 When does the mitral valve close?

109 What is the function of the chordae tendineae and papillary muscles?

110 Where is the aortic (semilunar) valve located?

111 When does the aortic (semilunar) valve open?

112 What is the function of the aortic valve?

113 When does the aortic valve close?

114 Where is blood in the aorta trunk directed?

**Figure 23.23**

115 In reference to Figure 23.23, identify #1 - #11.

1 ______________________  7 _____________________
2 ______________________  8 _____________________
3 ______________________  9 _____________________
4 ______________________  10 ____________________
5 ______________________  11 ____________________
6 ______________________

**Figure 23.24**

116 In reference to Figure 23.24, identify #1 - #8.

1 ______________________  5 _____________________
2 ______________________  6 _____________________
3 ______________________  7 _____________________
4 ______________________  8 _____________________
117 What causes the opening and closing of the valves of the heart? ______________________________________

118 The free-edges of the atrioventricular valves point into the ________________________.

119 When are the atrioventricular valves open? ______________________________________

120 When are the atrioventricular valves closed? ______________________________________

121 As one-way valves, the atrioventricular valves prevent the back flow of blood into the ______________.

122 What is atrioventricular valve prolapse? ______________________________________

123 Which of the two atrioventricular valves is mostly involved in prolapse? ______________

124 The free-edges of the pulmonary and aortic valves point into the ________________________.

125 When are the pulmonary and aortic valves open? ______________

126 When are the pulmonary and aortic valves closed? ______________

127 As one-way valves, the pulmonary and aortic valves prevent the back flow of blood into the ______________.

VENTRICULAR WALLS

128 Which ventricle has the thickest wall? ______________

129 Do the right and left ventricles normally pump the same volume of blood? ______________

ELECTRICAL EVENTS OF THE HEART

131 What is an electrocardiogram? ______________________

132 How many leads are normally used in a diagnostic ECG? ______________

133 In reference to Figure 23.26, identify #1 - #4.

134 Where is the sinoatrial node (SA node) located? ______________

135 What is the function of the SA node? ______________

136 What is a cardiac cycle? ______________

137 What depolarizes after the SA node? ______________

138 What results from atrial depolarization? ______________

139 Where is the atrioventricular (AV) node located? ______________

140 When does the AV node depolarize? ______________

141 From the AV node list in sequence the structures that depolarize. ______________

142 What is the result of the depolarization of the ventricular myocardium? ______________
ECG Waves

143 In reference to Figure 23.27, identify #1 - #10.
1 ______________________  6 _____________________
2 ______________________  7 _____________________
3 ______________________  8 _____________________
4 ______________________  9 _____________________
5 ______________________  10 ___________________

144 What are three distinctive waves of a normal ECG? ______________
_______________________

145 When does the P wave begin, and what does it represent? ______________
_______________________

146 What does the QRS complex represent? ______________
_______________________

147 What does the T wave represent? ______________
_______________________

148 What is the P-Q interval? ______________
_______________________

149 What is the Q-T interval? ______________
_______________________

150 What is the S-T segment? ______________
_______________________

Figure 23.28
151 In reference to Figure 23.28, identify #1 - #9.
1 ______________________  6 _____________________
2 ______________________  7 _____________________
3 ______________________  8 _____________________
4 ______________________  9 _____________________
5 ______________________

Figure 23.29
152 Match the numbers of the heart illustrations with their ECG tracing (A - F).
1 ______________________  4 _____________________
2 ______________________  5 _____________________
3 ______________________  6 _____________________
CARDBIAC CYCLE

153 What characterizes a normal sinus rhythm? ________________________________

154 The average heart rate is _______ beats per minute, taking _______ second per beat.

155 During the end of the previous cardiac cycle (following T wave) the heart is in its ___________ period.

156 During the resting period both the atria and the ventricles are ______________ with blood.

157 During the resting period the atrioventricular valves are __________ and the semilunar valves are ____________.

158 Atrial depolarization, shown on the ECG by the ______ wave, results in atrial _____________.

159 How long is atria systole? _________________________

160 How long is atrial diastole?_____________________

161 The QRS complex represents the ___________ of the ventricles and results in ventricular _________.

162 The atrioventricular valves close when pressure in the ventricles is ___________ than pressure in the atria, and produces the _________________.

163 The pulmonary and aortic valves open when pressure in the ventricles is ___________ than pressure in the pulmonary trunk and aorta.

164 Blood ejection causes the elastic arteries to ___________ to accommodate the increased blood volume.

165 The T wave represents ventricular ___________ and results in ventricular ___________.

166 The pulmonary and aortic valves close when ventricular pressure is ___________ than pressure in the pulmonary trunk and aorta, and produces the _________________.

167 When ventricular pressure is ___________ than atrial pressure, the atrioventricular valves ___________.

168 The elastic arteries ___________ and provide the force to continue driving blood through the circulatory system.

169 The expansion and recoil of the elastic arteries are described as the _______________.

AUSCULTATION OF HEART

170 Match the numbers of the heart illustrations showing blood flow with their ECG and heart sound tracings (A - F).

1 ___________  4 ___________

2 ___________  5 ___________

3 ___________  6 ___________

171 What is auscultation? ________________________________

172 What site is the best site for auscultation of the aortic semilunar valve? ________________

173 What site is the best site for auscultation of the pulmonary semilunar valve? ________________

174 What site is the best site for auscultation of the mitral (bicuspid) valve? ________________

175 What site is the best site for auscultation of the tricuspid valve? ________________
176 In reference to Figure 23.31, identify #1 - #6.
1 ______________________
2 ______________________
3 ______________________
4 ______________________
5 ______________________
6 ______________________

**CARDIAC MUSCLE**

177 What are several characteristics of cardiac muscle fibers?

178 The T tubes of cardiac muscle are _____________, and cardiac muscle does not have _____________.

179 Contraction of cardiac muscle is dependent upon the presence of _____________ ions.

180 Calcium ions are delivered from the _____________ and the _____________ environment.

181 Contraction is terminated by the removal of _____________.

182 Intercalated discs contain ____ junctions and _______.

183 Gap junctions function as _________________.

184 Desmosomes function in providing _________________.

185 The pacemaker, or sinoatrial node, is controlled by the ___ _____________.

186 In reference to Figure 23.32, identify #1 - #8.
1 ______________________
2 ______________________
3 ______________________
4 ______________________
5 ______________________
6 ______________________
7 ______________________
8 ______________________

**CARDIAC MUSCLE CELLS - ACTION POTENTIAL**

187 In reference to Figure 23.33, identify #1 - #3.
1 ______________________
2 ______________________
3 ______________________

188 The cardiac action potential is divided into three segments, _________________.

189 The segment of rapid depolarization is due to the opening of _________________ channels.

190 The segment of rapid depolarization results in the beginning of muscle _________________.

191 The segment of slow depolarization is due to the opening of _________________ channels.

192 During the segment of slow depolarization, cross-bridge activation _________________ producing increased tension.

193 The segment of repolarization is due to the opening of _________________.

194 During the segment of repolarization, the sarcolemma is returned to resting potential by the _________________.

____________________________________
____________________________________
195 In reference to Figure 23.34, identify #1 - #5.
1 ____________________
2 ____________________
3 ____________________
4 ____________________
5 ____________________

CARDIAC CONDUCTION FIBERS
196 What are some of the conduction pathways? ____________________
197 What is the function of conduction pathways? ____________________
198 What are Purkinje fibers? ____________________

CARDIAC OUTPUT
201 What is cardiac output? ____________________
202 How is cardiac output calculated? ____________________

STROKE VOLUME
203 What is stroke volume? ____________________
204 How is stroke volume calculated? ____________________
205 What is end diastolic volume? ____________________
206 What is end systolic volume? ____________________

Changes affecting the End Diastolic Volume
207 What are two factors that affect the end diastolic volume? ____________________
208 How does fill time affect the end diastolic volume? ____________________
209 How does venous return affect the end diastolic volume? ____________________
Changes affecting the End Systolic Volume

210 What are three factors that influence the end systolic volume? _________________________________________
______________________________________________

211 What is preload? ____________________________________________

212 Stretching of the myocardium (within limits) produces a ___________ alignment between the thin filaments and the thick filaments.

213 According to ______________ law of the heart (more / less) blood is ejected when the myocardium is stretched.

214 What is contractility? ____________________________
______________________________________________

215 What are three factors that affect contractility? _________
________________________________________________________________

216 What is afterload? __________________________________________

217 What determines afterload? ________________________________

218 The greater the pressure in the exiting vessels of the ventricles, the ____________ the afterload.

219 What is the primary factor that influences afterload? __________
________________________________________________________________

HEART RATE

220 Heart rate is primarily controlled by the ____________

221 The parasympathetic division ____________ heart rate.

222 The sympathetic division ____________ heart rate.

223 In addition to the ANS other factors that influence heart rate are __________________________________________
________________________________________________________________

224 The normal range for the heart rate is ________________, with most people averaging ________________.

225 Bradycardia is ______________________________________

226 Tachycardia is ________________________________________