

Review Questions for the Heart:

1. *What is the primary function of the heart?*
2. *Where is the heart located?*
3. *What and where are the apex and base of the heart?*
4. *What encloses the heart?*
5. *How many layers make up the pericardium?*
6. *Of what is the fibrous pericardium composed?*
7. *What is the function of the fibrous pericardium?*
8. *How many layers make up the serous pericardium?*
9. *What is another name for the visceral serous pericardium?*
10. *Where is the pericardial cavity?*
11. *What is the function of pericardial fluid?*
12. *What kind of tissue makes up the epicardium? Why?*
13. *Of what kind of tissue is the myocardium composed?*
14. *What is the function of the myocardium?*
15. *Of what kind of tissue is the endocardium composed?*
16. *What is the function of the endocardium?*
17. *Where and what are the atria?*
18. *Where and what are the ventricles?*
19. *What separates the 2 atria?*
20. *What separates the 2 ventricles?*
21. *How many actual pumps does the heart contain? Why?*
22. *What is the pulmonary circuit?*
23. *What is the systemic circuit?*
24. *How do these circuits differ?*
25. *Why are the atria thinly muscled?*
26. *What vessels empty into the right atrium? From where do they drain blood?*
27. *What separates the right atrium and the right ventricle?*
28. *What vessels empty into the left atrium? From where do they drain blood?*
29. *What are the fossa ovalis and the foramen ovale?*
30. *Why was the foramen ovale necessary for the fetal heart?*
31. *What receives blood from the right ventricle?*
32. *What prevents backflow into the right ventricle?*
33. *What receives blood from the left ventricle?*
34. *What prevents backflow into the left ventricle?*
35. *Which ventricle is larger? Why?*
36. *Which ventricle pumps more blood per stroke? Per minute?*
37. *What is the general path of the systemic circuit?*
38. *What is the general path of the pulmonary circuit?*
39. *Why is the heart said to contain 2 pumps in series?*
40. *Why is the coronary circulation necessary?*
41. *What is the general path of the coronary circuit?*
42. *What % of blood enters the coronary circuit?*
43. *What are anastomes and collateral routes?*
44. *What is the function of heart valves?*

45. *Of what kind of tissue are heart valves composed?*
46. *What and where are the 2 classes of heart valves?*
47. *What is the difference btwn the left and right atrioventricular valves?*
48. *What structures function to prevent atrioventricular valve prolapse? How?*
49. *What actually causes valves to shut?*
50. *What are the types of cardiac muscle cells?*
51. *What are the characteristics of the contractile cardiac muscle cells?*
52. *What are intercalated discs?*
53. *What are gap junctions and desmosomes?*
54. *Why is the heart said to be a functional syncytium?*
55. *What is and what is the function of the fibrous skeleton of the heart?*
56. *How are heart rate and contractile force controlled?*
57. *What are autorhythmic cells? What can they do?*
58. *What are the locations of the autorhythmic cells?*
59. *Which group of autorhythmic cells has the fastest depolarization rate? What designation is given to this group b/c of that?*
60. *What is the sequence of depolarization of the autorhythmic cells?*
61. *What is the value of atrial contraction preceding ventricular contraction?*
62. *What is the only electrical connection btwn the atria and ventricles?*
63. *What is the functional significance of the fact that ventricular depolarization begins at the apex of the heart?*
64. *What part of the brain exerts the most control over heart rate?*
65. *What branches of the autonomic nervous system are associated with what cardiac control centers?*
66. *How does the sympathetic nervous system affect HR? What neurotransmitter is involved? What nerves are involved?*
67. *How does the parasympathetic nervous system affect HR? What neurotransmitter is involved? What cranial nerve is involved?*
68. *Which branch of the ANS exerts more influence on a resting heart?*
69. *What is the cardiac cycle?*
70. *What are systole and diastole?*
71. *Why does blood flow?*
72. *What are the divisions of the cardiac cycle?*
73. *During ventricular filling,*
 - a. *What is happening?*
 - b. *What valves are open?*
 - c. *What valves are closed?*
 - d. *Where is pressure low?*
 - e. *Where is pressure high?*
 - f. *What chambers are contracting? When?*
 - g. *What chambers are relaxing? When?*
 - h. *How does the majority of the blood enter the ventricle?*
 - i. *How does the rest of the blood enter the ventricle?*
 - j. *What is end diastolic volume? What is a typical value?*
74. *What are the phases of ventricular systole?*
75. *During isovolumetric contraction,*

- a. *What is happening?*
 - b. *What valves are open?*
 - c. *What valves are closed?*
 - d. *Where is pressure low?*
 - e. *Where is pressure high?*
 - f. *What chambers are contracting?*
 - g. *What chambers are relaxing?*
 - h. *What causes the 1st heart sound?*
 - i. *When does the 1st heart sound occur?*
 - j. *What does the 1st sound sound like?*
 - k. *At what point will isovolumetric contraction end? (Answer in terms of pressures!)*
76. *During ventricular ejection,*
- a. *What is happening?*
 - b. *What valves are open?*
 - c. *What valves are closed?*
 - d. *Where is pressure low?*
 - e. *Where is pressure high?*
 - f. *What chambers are contracting?*
 - g. *What chambers are relaxing?*
 - h. *What is end systolic volume? What is a typical value?*
 - i. *What is the reason for having an end systolic volume?*
 - j. *What is stroke volume? What is an equation for stroke volume?*
 - k. *When does ventricular ejection end? (Answer in terms of pressures!)*
77. *During isovolumetric relaxation,*
- a. *What is happening?*
 - b. *What valves are open?*
 - c. *What valves are closed?*
 - d. *Where is pressure low?*
 - e. *Where is pressure high?*
 - f. *What chambers are contracting?*
 - g. *What chambers are relaxing?*
 - h. *What causes the 2nd heart sound?*
 - i. *When does the 2nd heart sound occur?*
 - j. *What does the 2nd sound sound like?*
 - k. *At what point will isovolumetric relaxation end? (Answer in terms of pressures!)*
78. *How are the events of the cardiac cycle similar on the left and right sides of the heart? How are they different?*
79. *Which ventricle has a greater stroke volume?*
80. *What is cardiac output?*
81. *What is an equation for cardiac output?*
82. *What happens to CO during exercise?*
83. *What are 2 separate ways the cardioacceleratory center can influence HR?*
84. *What are 2 separate ways the cardioinhibitory center can influence HR?*
85. *What is vagal tone?*

86. *What is the relationship btwn HR and filling time?*
87. *What is the relationship btwn filling time and EDV?*
88. *How do changes in blood pressure influence HR?*
89. *How do changes in blood gases (O_2 and CO_2) and blood pH influence HR?*
90. *What drugs alter HR?*
91. *What are the main factors affecting SV?*
92. *What is preload?*
93. *What is the relationship btwn ventricular stretch and ventricular force?*
94. *What is venous return?*
95. *What is the relationship btwn HR, filling time, venous return, EDV, preload, and SV?*
96. *What is the Frank-Starling Law of the heart?*
97. *What is contractility?*
98. *Is contractility independent of preload?*
99. *What is the relationship btwn contractility, ESV, and SV?*
100. *What drugs affect contractility?*
101. *What is afterload?*
102. *What is the relationship btwn arterial BP and afterload?*
103. *What is the relationship btwn afterload, ESV, and SV?*