

Cardiovascular System – Heart Anatomy, Function, and Circulatory Pathways Practice Test (Sample)

Study Guide



Everything you need from our exam experts!

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Introduction

Preparing for a certification exam can feel overwhelming, but with the right tools, it becomes an opportunity to build confidence, sharpen your skills, and move one step closer to your goals. At Examzify, we believe that effective exam preparation isn't just about memorization, it's about understanding the material, identifying knowledge gaps, and building the test-taking strategies that lead to success.

This guide was designed to help you do exactly that.

Whether you're preparing for a licensing exam, professional certification, or entry-level qualification, this book offers structured practice to reinforce key concepts. You'll find a wide range of multiple-choice questions, each followed by clear explanations to help you understand not just the right answer, but why it's correct.

The content in this guide is based on real-world exam objectives and aligned with the types of questions and topics commonly found on official tests. It's ideal for learners who want to:

- Practice answering questions under realistic conditions,
- Improve accuracy and speed,
- Review explanations to strengthen weak areas, and
- Approach the exam with greater confidence.

We recommend using this book not as a stand-alone study tool, but alongside other resources like flashcards, textbooks, or hands-on training. For best results, we recommend working through each question, reflecting on the explanation provided, and revisiting the topics that challenge you most.

Remember: successful test preparation isn't about getting every question right the first time, it's about learning from your mistakes and improving over time. Stay focused, trust the process, and know that every page you turn brings you closer to success.

Let's begin.

How to Use This Guide

This guide is designed to help you study more effectively and approach your exam with confidence. Whether you're reviewing for the first time or doing a final refresh, here's how to get the most out of your Examzify study guide:

1. Start with a Diagnostic Review

Skim through the questions to get a sense of what you know and what you need to focus on. Your goal is to identify knowledge gaps early.

2. Study in Short, Focused Sessions

Break your study time into manageable blocks (e.g. 30 – 45 minutes). Review a handful of questions, reflect on the explanations.

3. Learn from the Explanations

After answering a question, always read the explanation, even if you got it right. It reinforces key points, corrects misunderstandings, and teaches subtle distinctions between similar answers.

4. Track Your Progress

Use bookmarks or notes (if reading digitally) to mark difficult questions. Revisit these regularly and track improvements over time.

5. Simulate the Real Exam

Once you're comfortable, try taking a full set of questions without pausing. Set a timer and simulate test-day conditions to build confidence and time management skills.

6. Repeat and Review

Don't just study once, repetition builds retention. Re-attempt questions after a few days and revisit explanations to reinforce learning. Pair this guide with other Examzify tools like flashcards, and digital practice tests to strengthen your preparation across formats.

There's no single right way to study, but consistent, thoughtful effort always wins. Use this guide flexibly, adapt the tips above to fit your pace and learning style. You've got this!

Questions

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1. If the SA node fails, what is the intrinsic rhythm of the AV node?
 - A. 40 to 50 beats per minute
 - B. 60 to 100 beats per minute
 - C. 20 to 40 beats per minute
 - D. 80 to 90 beats per minute

2. What occurs during ventricular relaxation?
 - A. Decreased ventricular pressure causes AV valves to open and SL valves to close passively.
 - B. AV valves close and SL valves open.
 - C. Increased ventricular pressure causes SL valves to close.
 - D. AV valves stay closed and SL valves stay closed.

3. The heart's autonomic control aims to increase which aspects when stimulated?
 - A. Rate, force of contraction, and coronary blood flow.
 - B. Rate only.
 - C. Force only.
 - D. Coronary constriction rather than dilation.

4. If EDV is 130 mL and SV is 70 mL, what is ESV?
 - A. 60 mL
 - B. 130 mL
 - C. 70 mL
 - D. 200 mL

5. What is the primary function of the heart's conduction system?
 - A. To initiate and conduct electrical signals to regulate contraction timing.
 - B. To contract the heart muscle directly.
 - C. To pump blood.
 - D. To regulate heart rate via hormones.

6. Which statement best defines autorhythmicity in cardiac tissue?
- A. The ability of nodal cells to depolarize and fire an action potential spontaneously
 - B. The ability to contract in a coordinated rhythm
 - C. The ability to respond to external nerves to trigger contraction
 - D. The ability to repolarize without any stimulus
7. What is angina pectoris?
- A. Heart pain during rest
 - B. Heart pain during strenuous activity, usually felt on the left side of the chest, left arm, or jaw
 - C. Numbness in feet
 - D. Shortness of breath at rest only
8. Aging-related vascular changes contribute to which of the following?
- A. Reduced afterload
 - B. Increased afterload
 - C. Unchanged arterial stiffness
 - D. Decreased venous return
9. What are premature ventricular contractions?
- A. Abnormal action potentials within the AV node or ventricles, often due to stress or stimulants.
 - B. Early atrial impulses causing extra P waves.
 - C. Ventricular tachycardia.
 - D. Supraventricular premature beats.
10. What separates the right and left ventricles?
- A. Interatrial septum
 - B. Interventricular septum
 - C. Fossa ovalis
 - D. Papillary muscles

Answers

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1. A
2. A
3. A
4. A
5. A
6. A
7. B
8. B
9. A
10. B

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Explanations

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1. If the SA node fails, what is the intrinsic rhythm of the AV node?

- A. 40 to 50 beats per minute
- B. 60 to 100 beats per minute
- C. 20 to 40 beats per minute
- D. 80 to 90 beats per minute

When the primary pacemaker (the SA node) fails, the heart relies on a backup pacemaker with automaticity in the conduction pathway below it. The AV node acts as this secondary pacemaker, and its intrinsic rhythm is slower, around 40–60 beats per minute. The option showing 40–50 bpm sits squarely within that AV nodal escape range, making it the best choice. The SA node typically drives 60–100 bpm, and the Purkinje/Ventricular system can pace at about 20–40 bpm, so those ranges reflect other parts of the conduction hierarchy. The 80–90 bpm range is not characteristic of AV nodal automaticity.

2. What occurs during ventricular relaxation?

- A. Decreased ventricular pressure causes AV valves to open and SL valves to close passively.
- B. AV valves close and SL valves open.
- C. Increased ventricular pressure causes SL valves to close.
- D. AV valves stay closed and SL valves stay closed.

During ventricular relaxation the ventricle's pressure falls. This drop allows the atrioventricular valves (the ones between atria and ventricles) to open, so blood can flow passively from the atria into the ventricles. At the same time, the semilunar valves (the aortic and pulmonary valves) stay closed because the arterial pressures in the aorta and pulmonary artery are still higher than the ventricular pressure, preventing backflow. So the key idea is a fall in ventricular pressure enabling AV valve opening and SL valve closure, leading to passive ventricular filling.

3. The heart's autonomic control aims to increase which aspects when stimulated?

- A. Rate, force of contraction, and coronary blood flow.
- B. Rate only.
- C. Force only.
- D. Coronary constriction rather than dilation.

When the autonomic system stimulates the heart, it raises overall cardiac performance to meet higher demands. Nerve impulses releasing norepinephrine target the heart's beta-1 receptors in the SA and AV nodes, speeding up the pace of pacemaker activity and conduction, so the heart rate climbs. They also increase calcium availability in cardiac muscle cells, strengthening each beat and boosting force of contraction. To support this higher level of activity, the coronary circulation must deliver more blood to supply the myocardium's greater oxygen and nutrient needs; sympathetic activation promotes dilation of coronary vessels (via beta receptors and local metabolic factors), increasing coronary blood flow. In contrast, parasympathetic stimulation would slow the rate and reduce contractility, with minimal direct impact on coronary flow.

4. If EDV is 130 mL and SV is 70 mL, what is ESV?

- A. 60 mL
- B. 130 mL
- C. 70 mL
- D. 200 mL

Stroke volume is how much blood the ventricle ejects per beat, and it equals the filling volume before contraction (end-diastolic volume) minus the volume left after contraction (end-systolic volume). So, $ESV = EDV - SV$. With $EDV = 130\text{ mL}$ and $SV = 70\text{ mL}$, the end-systolic volume is $130 - 70 = 60\text{ mL}$. This reflects the amount remaining in the ventricle after ejection. The other numbers don't fit because they'd imply either no ejection, the wrong remaining volume, or an impossible scenario (e.g., ejecting more than you filled).

5. What is the primary function of the heart's conduction system?

- A. To initiate and conduct electrical signals to regulate contraction timing.
- B. To contract the heart muscle directly.
- C. To pump blood.
- D. To regulate heart rate via hormones.

The heart's conduction system is the electrical network that starts and spreads impulses to control when each chamber contracts. It begins in the sinoatrial node, sets the rhythm, then conducts through the atrioventricular node and the His–Purkinje system so the atria contract first to fill the ventricles, followed by ventricular contraction. This coordination regulates contraction timing, ensuring the heartbeat is orderly and synchronized. The actual squeezing force comes from the heart muscle cells responding to these impulses, not from the conduction system itself. Directly contracting the heart muscle is the muscle's job, not the wiring that tells it when to contract. Pumping blood is the result of those contractions, not the primary function of the electrical system. Hormones can modulate the heart rate by influencing the conduction system, but their role is modulatory rather than establishing the core timing and sequence of electrical impulses.

6. Which statement best defines autorhythmicity in cardiac tissue?

- A. The ability of nodal cells to depolarize and fire an action potential spontaneously
- B. The ability to contract in a coordinated rhythm
- C. The ability to respond to external nerves to trigger contraction
- D. The ability to repolarize without any stimulus

Autorhythmicity is the heart's own built-in ability to generate electrical impulses without external input. Certain cardiac cells, the nodal or pacemaker cells (notably in the SA node), have an unstable resting potential that slowly depolarizes—a pacemaker potential—until it reaches threshold and triggers an action potential. This spontaneous firing sets the heart's rhythm and initiates the conduction wave that coordinates contraction. The autonomic nervous system can modulate how fast or slow this intrinsic rhythm runs, but the impulse generation itself is inherent to these pacemaker cells. The other ideas describe contraction in general, modulation by nerves, or a phase of the action potential, but they don't define the intrinsic, automatic generation of impulses that autorhythmicity refers to.

7. What is angina pectoris?

- A. Heart pain during rest
- B. Heart pain during strenuous activity, usually felt on the left side of the chest, left arm, or jaw
- C. Numbness in feet
- D. Shortness of breath at rest only

Angina pectoris is chest discomfort caused by a temporary mismatch between the heart's oxygen demand and its blood supply. It most often appears during exertion or stress when the heart needs more oxygen, but the coronary arteries can't supply enough. The hallmark is heart pain or pressure behind the chest that radiates to the left side of the chest, the left arm, or the jaw. This pain is typically relieved by rest and often by nitroglycerin. Pain at rest or numbness in the feet aren't typical angina patterns and suggest other conditions.

8. Aging-related vascular changes contribute to which of the following?

- A. Reduced afterload
- B. Increased afterload
- C. Unchanged arterial stiffness
- D. Decreased venous return

Afterload is the pressure the left ventricle must overcome to eject blood during systole. As arteries age, they become stiffer from structural changes in the vessel wall—loss of elastin, increased collagen, and calcification. This arterial stiffening raises systolic pressure and the overall resistance the heart must push against, so the left ventricle works harder to eject blood. The increased stiffness also speeds up pulse-wave transmission and causes reflected waves to reach the heart earlier, boosting central aortic pressure and further increasing afterload. Because of this, aging-related vascular changes elevate afterload rather than reduce it, and they don't make venous return the primary issue.

9. What are premature ventricular contractions?

- A. Abnormal action potentials within the AV node or ventricles, often due to stress or stimulants.
- B. Early atrial impulses causing extra P waves.
- C. Ventricular tachycardia.
- D. Supraventricular premature beats.

Premature ventricular contractions are extras beats that start in the ventricles, not in the atria, and occur earlier than the next expected normal beat. They arise from an ectopic ventricular focus, so the impulse spreads through the ventricles abnormally, producing a wide, bizarre QRS complex and usually without a preceding P wave. Because the ventricle fires early and outside the normal conduction pathway, you often see a compensatory pause after the beat. They're commonly triggered by factors like stress or stimulants. This description—the abnormal ventricular origin and the resulting premature, wide QRS beat—is why this option best captures what PVCs are.

10. What separates the right and left ventricles?

- A. Interatrial septum
- B. Interventricular septum
- C. Fossa ovalis
- D. Papillary muscles

The key idea is that the structure separating the right and left ventricles is the interventricular septum. This muscular wall forms the boundary between the two ventricular chambers, keeping deoxygenated blood in the right ventricle from mixing with the oxygenated blood in the left ventricle. It has a thick muscular portion and a small membranous portion near the heart's base, and it even houses part of the heart's conduction system, helping coordinate ventricular contraction. The other structures mentioned don't separate the ventricles: the interatrial septum divides the atria, the fossa ovalis sits on the interatrial septum as a remnant of the foramen ovale, and the papillary muscles are inside the ventricles anchored to the chordae tendineae, not separating the ventricles.

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Next Steps

Congratulations on reaching the final section of this guide. You've taken a meaningful step toward passing your certification exam and advancing your career.

As you continue preparing, remember that consistent practice, review, and self-reflection are key to success. Make time to revisit difficult topics, simulate exam conditions, and track your progress along the way.

If you need help, have suggestions, or want to share feedback, we'd love to hear from you. Reach out to our team at hello@examzify.com.

Or visit your dedicated course page for more study tools and resources:

<https://cardiosysanatomyfunctionpathways.examzify.com>

We wish you the very best on your exam journey. You've got this!

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