Router and Routing Basics 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

1. Which statement is true about scalability in networks?

A. It measures how quickly data can be encrypted

B. It indicates how easily the network can accommodate more users and data transmission requirements as they increase

C. It is the same as reliability

D. It depends only on hardware quality

2. LANS are Ethernet networks that contain which devices?

A. PCs, printers, and servers

B. Smartphones and tablets

C. Routers and switches

D. Only servers

3. Which statement best describes Physical Topology?

A. It describes how data is conceptually transferred, not the actual wiring.

B. It describes the arrangement of cables and devices as they are actually connected.

C. It defines the network's security policy.

D. It defines the logical paths data takes.

4. What is the correct sequence of steps a router takes when forwarding a packet destined for another network?

A. De-encapsulates the Layer 2 frame header and trailer to expose the Layer 3 packet; examines the destination IP address to find the best path in the routing table; if a path is found, encapsulates the Layer 3 packet into a new Layer 2 frame and forwards the frame out the exit interface.

B. Examines the IP header before de-encapsulating the Layer 2 frame, then forwards without encapsulation.

C. Encapsulates the Layer 3 packet into a Layer 2 frame and broadcasts it on all interfaces.

D. Drops the packet if the destination is not directly connected.

5. Which device typically acts as the route for traffic destined for destinations outside the local network?

A. Default Gateway

B. DNS Server

C. DHCP Server

D. Switch

6. What does the letter L stand for in the routing table?

A. Local route interfaces

B. Local route entries

C. Local router

D. Local address

7. In a routing table, which symbol indicates a route that is manually configured?

A. Directly connected interfaces

B. Static routes

C. Learned dynamically from another router using the EIGRP routing protocol

D. Learned dynamically from another router using the OSPF protocol

8. Define Availability.

A. The likelihood that the network is available when its use is required

B. The physical arrangement of cables

C. The maximum data rate of a link

D. The cost to maintain service

9. Which statement best describes RAM?

A. It is volatile and stores programs and data the CPU needs in real time

B. It is non-volatile and retains data after power-off

C. It stores the bootup instructions and basic diagnostic software

D. It stores the startup configuration file

10. What does the letter O indicate in the routing table?

A. Learned dynamically from the OSPF protocol

B. Directly connected interfaces

C. Static routes

D. Learned dynamically from another router using the EIGRP routing protocol

Answers

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

Explanations

1. Which statement is true about scalability in networks?

A. It measures how quickly data can be encrypted

B. It indicates how easily the network can accommodate more users and data transmission requirements as they increase

C. It is the same as reliability

D. It depends only on hardware quality

Scalability in networks is about a system's ability to grow and handle increasing load—more users, more devices, more data traffic—without unacceptable performance loss. The best statement reflects this growth aspect by saying the network's scalability shows how easily it can accommodate more users and data transmission requirements as they increase. In practice, scalability comes from scalable architectures and strategies such as adding resources horizontally (more routers, switches, or links), using load balancing, and employing protocols that work well as the network grows. It's not about how quickly data can be encrypted, which is a security concern; it's not the same as reliability, which is about consistent performance under expected conditions; and it isn't determined solely by hardware quality, since software design and network topology also shape how well a network scales.

2. LANS are Ethernet networks that contain which devices?

A. PCs, printers, and servers

B. Smartphones and tablets

C. Routers and switches

D. Only servers

A LAN is a local Ethernet network that connects end-user devices and shared resources in a small area. The devices you'd typically find on such a network are computers (PCs), printers, and servers, which are the hosts that users interact with and that provide or access services across the network. Routers and switches are essential network infrastructure that link devices together, but they aren't the end devices the LAN contains for user tasks. Smartphones and tablets can join a LAN, usually via wireless, but Ethernet LANs emphasize wired end devices, not mobile gadgets. So, the most representative devices a LAN contains are PCs, printers, and servers.

3. Which statement best describes Physical Topology?

A. It describes how data is conceptually transferred, not the actual wiring.

B. It describes the arrangement of cables and devices as they are actually connected.

C. It defines the network's security policy.

D. It defines the logical paths data takes.

Physical topology is all about the tangible hardware layout—the actual wiring and placement of devices and cables. It answers how devices are physically connected in the real world, such as which devices connect directly to which cables, where switches or hubs sit, and how cables run between them. That's why the statement describing the arrangement of cables and devices as they are actually connected is the best fit. Think of it as the hardware map of a network. The way data moves still depends on devices like switches and routers, but physical topology is about the concrete, cables-and-n hardware arrangement. In contrast, data flow or routing paths describe logical topology, which is about the paths data takes, not the physical wires. Policies like security rules are separate topics entirely.

4. What is the correct sequence of steps a router takes when forwarding a packet destined for another network?

A. De-encapsulates the Layer 2 frame header and trailer to expose the Layer 3 packet; examines the destination IP address to find the best path in the routing table; if a path is found, encapsulates the Layer 3 packet into a new Layer 2 frame and forwards the frame out the exit interface.

B. Examines the IP header before de-encapsulating the Layer 2 frame, then forwards without encapsulation.

C. Encapsulates the Layer 3 packet into a Layer 2 frame and broadcasts it on all interfaces.

D. Drops the packet if the destination is not directly connected.

When forwarding a packet to another network, the router first removes the Layer 2 frame header and trailer to expose the Layer 3 IP packet. It then examines the destination IP address and consults its routing table to determine the best path and the next hop. If a route is found, the router encapsulates the IP packet into a new Layer 2 frame addressed to the next-hop's MAC address on the chosen exit interface and forwards it out that interface. If no route exists, the router will typically drop the packet (often sending an ICMP destination-unreachable message). The other options skip the necessary re-encapsulation, broadcast to all interfaces, or assume the destination is directly connected, which isn't how routing forwards packets to remote networks.

5. Which device typically acts as the route for traffic destined for destinations outside the local network?

A. Default Gateway

B. DNS Server

C. DHCP Server

D. Switch

When hosts on a local network need to reach destinations outside that network, they send those packets to a single next-hop device configured for that purpose—the default gateway. This gateway knows how to reach remote networks and is typically the router's interface on the local LAN, often using a default route like 0.0.0.0/0 to forward any unknown destination onward toward the internet or other networks. The DNS server, by contrast, is for translating domain names to IP addresses and doesn't route traffic. The DHCP server assigns IP addresses and configuration to clients, not routing decisions. A switch moves frames within the local network; it doesn't route traffic to destinations outside the local subnet unless it's a specialized Layer 3 switch. So the device that handles traffic destined for outside the local network is the default gateway.

6. What does the letter L stand for in the routing table?

A. Local route interfaces

B. Local route entries

C. Local router

D. Local address

L marks a local route: it represents the host route to the IP address assigned to one of the router's interfaces. This lets the router deliver packets destined to its own interface address directly on that interface, rather than trying to forward them somewhere else. For example, if an interface is configured with 192.168.1.1, there will be a local route for that exact address (a /32) labeled L so the stack can handle packets addressed to 192.168.1.1 locally. This concept is best captured by the option describing Local route interfaces, since it refers to the routes that point to the router's own interface addresses.

7. In a routing table, which symbol indicates a route that is manually configured?

A. Directly connected interfaces

B. Static routes

C. Learned dynamically from another router using the EIGRP routing protocol

D. Learned dynamically from another router using the OSPF protocol

Routes that are manually configured are static routes. A static route is added by an administrator with a fixed destination and next-hop or exit interface, and it does not rely on any routing protocol to learn or update it. In many router displays, static routes are shown with a specific symbol (often S) to distinguish them from routes learned automatically. Directly connected routes come from interfaces that are attached to the router, and they're typically indicated differently (not static). Routes learned via dynamic protocols like EIGRP or OSPF are learned from neighboring routers and carry symbols associated with those protocols, not a manual, administrator-defined entry.

8. Define Availability.

A. The likelihood that the network is available when its use is required

B. The physical arrangement of cables

C. The maximum data rate of a link

D. The cost to maintain service

Availability measures how often the network is up and usable when you need to use it. It's about uptime—the portion of time the service is accessible. In practice, it's expressed as a percentage of time the network is available, and it can be related to MTBF and MTTR with the formula MTBF / (MTBF + MTTR). Higher availability means less downtime, often achieved through redundancy, reliable failover, and proactive maintenance. The other options describe topology (how cables are arranged), capacity (maximum data rate), or cost, which are different concepts than being accessible when required.

9. Which statement best describes RAM?

A. It is volatile and stores programs and data the CPU needs in real time

B. It is non-volatile and retains data after power-off

C. It stores the bootup instructions and basic diagnostic software

D. It stores the startup configuration file

RAM is the computer's working memory. It is volatile, so its contents disappear when power is removed. It holds the programs and data the CPU needs while the computer is running, allowing fast, real-time access. When you launch an application, the OS loads it from permanent storage into RAM so the CPU can fetch instructions and operate on data quickly. The other descriptions refer to non-volatile memory: firmware stores boot-up instructions, and flash/NVRAM retain startup or configuration data without power. Because RAM's role is fast, temporary storage for active code and data and its volatility, the statement describing it as volatile and used for real-time access to programs and data is the best match.

10. What does the letter O indicate in the routing table?

A. Learned dynamically from the OSPF protocol

B. Directly connected interfaces

C. Static routes

D. Learned dynamically from another router using the EIGRP routing protocol

In a router's routing table, each entry shows a code that indicates how that route was learned. The letter O specifically flags routes that came from the OSPF protocol. That means the path was learned dynamically through OSPF's SPF process, not from a directly connected network (which would be C) and not from a static entry (which would be S). It's different from how EIGRP routes would appear, which use a different code. So the O indicates the route was learned via OSPF, making it the best answer.

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://routerroutingbasics.examzify.com

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