NTA ROBOTICS SAFETY AND SYSTEMS REVIEW (SAMPLE)

STUDY GUIDE

SAMPLE STUDY GUIDE WITH LIMITED QUESTIONS

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Table of Contents

Copyright 1

Table of Contents 2

Introduction 3

How to Use This Guide 4

Questions 5

Answers 8

Explanations 10

Next Steps 15

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. What is non-routine operation and how does it affect risk assessment?

A. Regular tasks requiring no extra controls

B. Only software updates

C. Operations not part of normal programmed tasks (e.g., setup, maintenance) requiring additional risk assessment and temporary controls.

D. The same as routine operations

2. Which standard provides guidance on collaborative robots and human-robot interactions?

A. ISO 10218-1

B. ISO 9001

C. ISO/TS 15066

D. ISO/TS 16949

3. Dual Safety Check (DCS) includes Emergency Stop Control.

A. True

B. False

C. Not specified

D. Sometimes

4. Which function is a responsibility of the Handling Tool Application software loaded in the robot controller?

A. Program application

B. Contains specific fault isolation and diagnostics

C. Defines the function of the robot

D. Defines communication protocols

5. What content does a safety case typically contain?

A. Hazard analysis, risk reduction, verification/validation, and operational experience.

B. Market analysis, sales forecasts, and warranty terms.

C. Detailed manufacturing instructions only.

D. End-user manuals and advertising materials.

6. What is 'SSM' and why is it critical for cobots?

A. System Safety Monitoring.

B. Speed and Separation Monitoring; ensures safe operating distance between cobot and humans.

C. Sensor Signal Modulation.

D. Safe Sequence Management.

7. Which item is commonly considered part of the robot controller's domain?

A. Teach pendant

B. Hydraulic pump

C. Pneumatic cylinder

D. Cooling fan

8. Safeguards must be established for which operations in a robot system?

A. Teaching

B. Maintenance

C. Operating

D. All of the above

9. A robot described as six-axis has how many joints contributing to movement?

A. Six

B. Four

C. Three

D. Eight

10. The restrictive space and the operating space always refer to the same space in a robot's work environment.

A. True

B. False

C. Not Applicable

D. Not Sure

Answers

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

Explanations

1. What is non-routine operation and how does it affect risk assessment?

A. Regular tasks requiring no extra controls

B. Only software updates

C. Operations not part of normal programmed tasks (e.g., setup, maintenance) requiring additional risk assessment and temporary controls.

D. The same as routine operations

Non-routine operation means activities that fall outside the normal programmed tasks of a machine or system, such as setup, commissioning, adjustments, maintenance, or changeovers. Because these tasks are not part of the usual workflow, they bring in unfamiliar or evolving hazards that the standard controls may not cover. That's why the risk assessment for these tasks must be done anew, identifying any new hazards, assessing how the equipment state and human factors change the risk, and deciding on temporary controls to manage those specific risks. This approach is essential because routine tasks have established procedures and historical controls, while non-routine work introduces variability and uncertainty. It's not just about a different activity type; it's about the need to pause, re-evaluate hazards, and implement appropriate temporary measures, training, and oversight to keep people safe during that task.

2. Which standard provides guidance on collaborative robots and human-robot interactions?

A. ISO 10218-1

B. ISO 9001

C. ISO/TS 15066

D. ISO/TS 16949

Collaborative robots require explicit guidance on how humans and machines share a workspace safely. ISO/TS 15066 provides that focus, offering guidance on how to design and operate cobots and manage human–robot interactions. It outlines risk assessment approaches and practical safety measures for collaborative work, including modes of collaboration such as hand-guiding, speed and separation monitoring, and power and force limiting. This standard complements the broader industrial robot safety framework by specifically addressing how humans and robots interact in shared spaces. The other standards address different topics: ISO 9001 is about quality management systems, and ISO/TS 16949 relates to automotive industry quality management. ISO 10218-1 covers general safety requirements for industrial robots, but ISO/TS 15066 is the one that directly targets collaboration with people and the specifics of human–robot interaction.

3. Dual Safety Check (DCS) includes Emergency Stop Control.

A. True

B. False

C. Not specified

D. Sometimes

The key idea is that a Dual Safety Check design uses two independent safety paths so a fault in one path can't allow unsafe operation. An Emergency Stop control is the primary human-initiated mechanism to bring a robot or cell to an immediate halt, so it belongs in this dual-path safety framework. Including the E-stop ensures there is a guaranteed, hard stop accessible to the operator, and it is wired or integrated so that pressing it affects both safety channels or is recognized by the safety logic as a stop command no matter what state the other parts of the system are in. This alignment preserves the purpose of having two safety checks: a single fault won't defeat the ability to stop safely. Therefore, the statement is true.

4. Which function is a responsibility of the Handling Tool Application software loaded in the robot controller?

A. Program application

B. Contains specific fault isolation and diagnostics

C. Defines the function of the robot

D. Defines communication protocols

The Handling Tool Application defines how the robot uses its end effector to perform the manipulation task. It specifies the function of the robot within that handling operation—what the tool should do, how it should grip, move, orient, and release the part, and how I/O and tool motions are coordinated for the handling task. This focuses on the tool's role in the operation itself, rather than where the overall program is stored or how diagnostics and communications are handled. For example, in a pick-and-place cycle, the Handling Tool Application governs the gripper action, tool approach, and release sequence, aligning with the specific handling function the robot must perform.

5. What content does a safety case typically contain?

A. Hazard analysis, risk reduction, verification/validation, and operational experience.

B. Market analysis, sales forecasts, and warranty terms.

C. Detailed manufacturing instructions only.

D. End-user manuals and advertising materials.

A safety case is a structured argument, supported by evidence, that a system is acceptably safe for its intended use. It typically includes hazard analysis to identify what could go wrong, the risk reduction measures that lower either the likelihood or severity of those hazards, verification and validation activities that show the system meets safety requirements and behaves as intended, and operational experience that provides real-world data on performance and any residual risk. The other options focus on business analysis, manufacturing instructions, or marketing materials, which do not constitute the evidence-based safety justification that a safety case provides.

6. What is 'SSM' and why is it critical for cobots?

A. System Safety Monitoring.

B. Speed and Separation Monitoring; ensures safe operating distance between cobot and humans.

C. Sensor Signal Modulation.

D. Safe Sequence Management.

Speed and Separation Monitoring is about keeping a safe distance between humans and the cobot by continuously tracking how far apart they are and how fast they're moving. The cobot uses sensors (like cameras, LiDAR, or pressure/force sensing) to monitor the workspace and, if a person gets too close or moves unpredictably, it can slow down, stop, or adjust its path to maintain a safe gap. This dynamic safety measure is essential in shared work environments because people aren't predictable, and rigid safety zones can't adapt in real time. By actively managing how fast the cobot operates in relation to nearby humans, SSM reduces the risk of contact, supports smoother collaboration, and helps meet safety standards for human–robot interaction. Safe Sequence Management, while sounding like it could relate to ordering actions safely, isn't the term used for this real-time proximity safety behavior.

7. Which item is commonly considered part of the robot controller's domain?

A. Teach pendant

B. Hydraulic pump

C. Pneumatic cylinder

D. Cooling fan

The main idea here is identifying what directly serves as the operator interface with the robot controller. The teach pendant is the handheld or mounted device used to program, teach positions, set parameters, and monitor the robot's status. It communicates with the controller, sends commands, and displays feedback, making it an integral part of how the controller operates and is managed. Actuation components like the hydraulic pump and pneumatic cylinder belong to the power and actuation subsystem; they execute motions but are not the interface through which the controller is programmed or supervised. The cooling fan provides thermal management for the electronics or drive system and is a support subsystem rather than the control interface. Thus, the teach pendant best fits the controller's domain because it directly enables programming and control of the robot.

8. Safeguards must be established for which operations in a robot system?

A. Teaching

B. Maintenance

C. Operating

D. All of the above

Safeguards are needed for every phase where humans interact with a robot: teaching, maintenance, and operation. When teaching or programming, the robot can move while a person is within the work envelope, creating risks from unexpected motion, pinch points, or crush hazards. Protective measures such as interlocked access, controlled turning on and off, safe programming modes, and clearly defined safe speeds help ensure a person isn't exposed to dangerous robot actions during setup or changes. During maintenance, workers may need to service or repair the robot and could be exposed to hazardous energy or unexpected movement. Safeguards here include isolating energy sources (lockout/tagout), verifying de-energization before work, safe access procedures, and ensuring moving parts cannot start unexpectedly while someone is servicing the system. In normal operation, the robot's moving parts can still pose collision or impact risks to nearby personnel or bystanders. Protective devices like fences, safety-rated interlocks, light curtains or mats, emergency stop devices, and clearly established safe operating procedures reduce the likelihood and severity of contact with the robot. Because each phase presents distinct hazards, safeguards must be established for all of these operations to comprehensively protect people and ensure safe, reliable robot performance.

9. A robot described as six-axis has how many joints contributing to movement?

A. Six

B. Four

C. Three

D. Eight

Six-axis describes a robot arm that has six joints (axes) that contribute to motion. Each axis adds one degree of freedom, so the arm can both reach and orient its end effector in three-dimensional space. In a common six-axis configuration, the joints are at the base rotation, shoulder, elbow, and three wrist joints (pitch, yaw, and roll), giving six independent movements. Therefore, the number of joints contributing to movement is six. If there were fewer joints, the arm would have limited reach or orientation; more joints would describe a different, nonstandard setup.

10. The restrictive space and the operating space always refer to the same space in a robot's work environment.

A. True

B. False

C. Not Applicable

D. Not Sure

Operating space is the volume in which the robot is designed to operate during normal tasks, defined by its reach and allowed motions. Restrictive space describes zones where movement is constrained for safety or practical reasons—areas the robot should avoid or enter only with safeguards, speed reductions, or interlocks. These are not the same; restrictive space can lie inside, outside, or overlap with the operating space depending on how safeguarding is configured. So the statement is false because the two terms refer to different concepts in robot safety and task planning.

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://ntaroboticssafetysys.examzify.com

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