

**Important:** All volunteers supporting regular season events in the United States and Canada must be screened and assigned using the Volunteer Management System and are required to complete their certification test using the [online volunteer certification](#) system.

This test is provided publicly for team use and volunteer certification as needed at events outside of the United States and Canada.

| Revision History |                                |
|------------------|--------------------------------|
| Revision         | Description                    |
| V26-27.1         | Initial 2026-27 Season Release |

## Questions

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- Q1. A team's mentor describes a problem this way: "Our op mode has a bug. Can you fix our code?" Which statement best captures how a CSA should think about this request?**
- A. The CSA should decline. Reviewing source code falls outside the CSA's scope of support.
  - B. The CSA should treat "it's the code" as a hypothesis to test, and work through the standard troubleshooting sequence before drawing a conclusion.
  - C. The CSA should open the source code first, since the mentor knows the robot and named a likely cause.
  - D. The CSA should redirect the team to the FTA, since op mode issues are a field-operations concern.
- Q2. During inspection, a Robot Inspector finds a control system issue they can't resolve and sends the team to you. What does this moment show about the CSA role?**
- A. The CSA is a backup inspector who re-checks robots that failed inspection.
  - B. The CSA is the deepest technical resource at the event. Other roles triage issues and hand teams to the CSA when a problem exceeds what they can resolve in the moment.
  - C. The CSA should send the team back to the Robot Inspector, since inspection issues fall outside the CSA's job.
  - D. The CSA assists teams during match play only, not during inspection.

- Q3. After a frustrating troubleshooting session, you're tempted to mention to the Judge Advisor, in passing, that a team's mentor was rude. Why is this the wrong move?**
- A. The Judge Advisor handles awards only, so any conduct concern should go to the Head Referee instead.
  - B. Volunteers should not provide feedback about team behavior to the Judges. Concerns should go through the normal escalation channels described in Section 1 of the Competition Manual.
  - C. The comment should go to the team's coach instead of the Judge Advisor.
  - D. Timing is the problem. This kind of feedback should wait until after awards are decided.
- Q4. A team mentor has been raising his voice at you about a referee call. You've listened and stayed calm, but he keeps escalating. What's your best next step?**
- A. Give the mentor a firm, official warning to defuse the situation.
  - B. Escalate the concern to the FTA, who manages the escalation path from there.
  - C. Go to the Head Referee directly, since the complaint concerns a referee call.
  - D. Contact the Event Director directly to report the mentor's behavior.
- Q5. After visually inspecting a robot and checking battery voltage, you want to connect your laptop to the team's REV Control Hub to inspect the log files and check the management interface. What step must you take first, and which local address accesses the Control Hub's management interface over Wi-Fi?**
- A. Ask the team's permission before connecting their device to your laptop and navigate to 192.168.43.1:8080.
  - B. Plug into the Control Hub immediately to save time before their next match and navigate to 192.168.43.1:8080.
  - C. Ask the team's permission before connecting their device to your laptop and navigate to 192.168.49.1:8080.
  - D. Ask the FTA for permission to connect to the robot and navigate to 10.0.100.5.
- Q6. Before the event, the CSA coordinates with the FTA (or Technical Director if staffed) on the wireless environment survey and channel assignments. What's the main reason this matters?**
- A. It satisfies a paperwork requirement that FIRST HQ checks after the event.
  - B. It gives the CSA and FTA a shared, current picture of the wireless environment, so connectivity problems on event day get diagnosed faster and more accurately.
  - C. It determines which teams can compete based on their robot's wireless setup.
  - D. It replaces the need for a Wi-Fi Analyzer app during the event.

- Q7. On event morning, why does the CSA check in with the Volunteer Coordinator before reporting to the FTA, rather than the reverse?**
- A. The Volunteer Coordinator outranks the FTA in the event's chain of command.
  - B. Checking in first confirms the CSA's presence on the event's volunteer roster, a required administrative step, before the technical briefing with the FTA.
  - C. The FTA typically isn't on-site until later in the morning, so there's no one to report to yet.
  - D. The order doesn't matter. It's a habit some CSAs follow.
- Q8. During qualification matches, where should the CSA generally be positioned, and why?**
- A. At the scoring table, to verify disputed match results immediately.
  - B. In the pits and field queue area, since the FTA directs teams there when a field-related technical issue can't be resolved quickly.
  - C. Wherever the loudest team currently needs help, moving as requests come in.
  - D. At a fixed help-desk location near the entrance, so teams know where to find them.
- Q9. Three teams need your help at once: one has a match in 20 minutes, one played an hour ago and has a low-stakes question, and one is loudly insisting they need help right now. What's the CSA's correct triage approach?**
- A. Help the loudest team first. Escalating volume usually signals the most serious problem.
  - B. Help whichever team has waited longest. That's the fairest approach.
  - C. Prioritize by match proximity: help the team with the closest match first, and give the other two an honest, specific ETA instead of leaving them wondering.
  - D. Ask the FTA to take one of the three teams so the workload splits evenly.
- Q10. A team disconnects mid-match and insists it was wireless interference. What standard has to be met before interference can be cited as the cause?**
- A. Any correlation between the disconnect and unusual spectrum activity during the match window is enough.
  - B. The team's conviction that it wasn't their equipment is enough, since they know their robot best.
  - C. Interference has to trace to excessive interference outside the team's control, with team-induced causes like battery, wiring, or software ruled out first.
  - D. If the FTA agrees it's plausible, that's enough to bring the case to the Head Referee.

- Q11. You've diagnosed a wiring issue on a team's robot. The mentor insists it's a software bug and pushes back hard. What's the most effective first response?**
- A. Restate your diagnosis, citing the log data and physical inspection behind it.
  - B. Acknowledge the mentor's concern and ask him to walk you through what he observed, including anything that changed on the hardware side recently.
  - C. Agree to check the software again, even though you're confident the wiring caused it.
  - D. Explain your confidence in the finding and move on to the next team.
- Q12. You notice a parent entering the pit area without safety glasses, heading toward a team's space where a robot may or may not be powered-on nearby. What's the best immediate action?**
- A. Let it go. It's perfectly okay to simply walk through the pits without safety glasses. If the parent is in the team's pit, and the robot is active, then at that point safety glasses are required for anyone in the pit.
  - B. Make a note for the Head Referee to give them a VERBAL WARNING.
  - C. Approach the parent directly, tell them safety glasses are required in this area, and point them toward a solution if they don't have a pair.
  - D. Wait to see if someone else has a problem and says something first.
- Q13. The FTA asks you to investigate reports of sluggish robot response near the practice field. You observe Driver Station ping times spiking into the 250–300ms range, and the team is operating on 2.4GHz Wi-Fi. Which reading of the situation is accurate?**
- A. A ping of 250–300ms is within normal operating limits; the sluggishness is almost certainly mechanical.
  - B. Ping times at or above 250–300ms indicate the Driver Station is having severe difficulty communicating with the robot; you should check for overlapping 2.4GHz interference sources like Bluetooth earbuds, wireless hotspots, or nearby microwave ovens.
  - C. Ping times at or above 250–300ms indicate severe communication difficulty, most likely caused by event staff using 900MHz walkie-talkies next to the practice field.
  - D. Abnormally high ping only begins at 350–400ms, so no wireless investigation is needed yet.

- Q14. The host team's robot at an event seems to suddenly and randomly lose connection on the practice field, and the team complains that their robot has only demonstrated problems when at the practice field and not in their pit or on the competition field. Robot ping times seem fine. Which root cause category should the CSA investigate first, and what does that call depend on?**
- A.** Robot electrical/mechanical. Disconnects trace back to the robot's own wiring (loose wire connections, frayed wires, or electro-mechanical issues), lack of a Grounding Strap, and battery most of the time.
  - B.** Control system/software. A seemingly clean disconnect with no warning usually points to an app or configuration issue.
  - C.** Wireless environment. The description points toward the Wi-Fi environment near the practice fields, though it still needs confirmation from spectrum monitoring data rather than assumption.
  - D.** The category doesn't matter, since all three get checked in every case regardless of symptoms.
- Q15. A student driver accidentally taps the Android home button on the Driver Station device during a match, and the robot stops moving immediately. The team comes to you convinced their Wi-Fi connection dropped. How should you explain what actually happened?**
- A.** Navigating away from the main screen of the Driver Station app automatically aborts the running OpMode as a safety measure, even though the Wi-Fi connection itself remains intact.
  - B.** Leaving the main screen of the Driver Station app terminates the Wi-Fi Direct group, requiring the devices to be re-paired in settings.
  - C.** The gamepad likely suffered an ESD event at the exact moment they touched the screen, which caused the Wi-Fi radio to reset.
  - D.** The Control Hub rebooted due to a software exception caused by the Driver Station app closing.
- Q16. You've diagnosed the cause of a robot problem, but the fix will take longer than the time remaining before the team's next match. What's the correct response?**
- A.** Rush the fix and skip a verification step, since making the match takes priority.
  - B.** Tell the team their match will be delayed until the fix is finished.
  - C.** Explain clearly to the team what's wrong and that it won't be fixed in time, and let the FTA know.
  - D.** Keep working the fix and update the team only if they ask.

- Q17. It's the end of a long event day. You haven't been asked to write a formal report, and you're tired. What should you still do before you leave?**
- A. Leave once your last team is helped. A formal debrief only happens if the FTA specifically requests one.
  - B. Check in with the FTA, and mention anything worth capturing, such as a pattern across multiple teams or a suggestion for future events.
  - C. Write a full written summary for FIRST HQ regardless of whether the FTA asked for one.
  - D. Find the Event Director and report on your day directly, since they oversee the whole event.
- Q18. The recommended opening line for a troubleshooting conversation asks the team to describe what their robot was doing, not what they think is causing it. Why does the script work this way?**
- A. It keeps the conversation shorter, since teams tend to give long answers when asked to speculate about causes.
  - B. It asks for observable behavior instead of a diagnosis, which keeps the conversation objective and gives the CSA a specific starting point to investigate.
  - C. It avoids putting the team on the spot, since guessing at a cause might embarrass them if they're wrong.
  - D. It matches the wording the Robot Inspectors use, so the team doesn't have to answer the same question twice in different ways.
- Q19. A team reports their robot is driving erratically and the joysticks seem to be doing the opposite of what they expect. Before diving into logs or wiring, what should you check first?**
- A. Whether the gamepad's MODE button was pressed, which swaps joystick functions, or whether the joysticks were centered when the gamepad was connected.
  - B. Whether the robot controller app and driver station app are both the current version.
  - C. Whether the battery voltage is within normal range.
  - D. Whether the team's Op Mode code references the correct device names in the configuration file.
- Q20. A team claims that "their batteries no longer work." You ask for follow-up information, and they tell you that several of their batteries are dead and no longer power their robot, and when put on a battery charger the batteries do not seem to want to charge (the LED on the battery charger doesn't change when the battery is plugged in). What should be your first debugging step?**
- A. Ask them to borrow a battery from a neighboring team.
  - B. Explain to them that the flywheel on their robot probably drained their battery so low the charger refuses to charge the battery out of an abundance of caution for safety.
  - C. Check the fuse on the battery.
  - D. Suggest that the team use a USB Battery Pack with Power Delivery Support to power their robot instead.

## Answer Key

| Question | Correct Response | Explanation                                                                                                                                                                                                                                                                                                                                                                                                | Source                                                             |
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| Q1       | B                | A mentor's hypothesis is useful context, but it's important to ask "what is the robot SUPPOSED to be doing, versus what is it CURRENTLY doing?" The CSA should understand the "problem" and determine if the cause of the problem is more likely a hardware/electrical problem or a software problem before opening the code, rather than accepting the team's guess or refusing to engage with it at all. | <i>Section 5 (troubleshooting process)</i>                         |
| Q2       | B                | Robot Inspectors, the FTA, and teams themselves refer problems to the CSA because the CSA provides depth those roles can't give in the moment.                                                                                                                                                                                                                                                             | <i>Section 1 (role overview)</i>                                   |
| Q3       | B                | Judges and the JA evaluate teams for awards based on what they observe. An offhand negative comment, stripped of the context behind a stressful technical interaction, can tilt that evaluation. Anything that needs to reach the JA should go through the normal escalation channels described in Section 1 of the CM.                                                                                    | <i>Section 1 (role overview)</i>                                   |
| Q4       | B                | Conduct concerns beyond what a kind reminder can resolve are routed to the FTA, regardless of how urgent the moment feels and regardless of who the underlying complaint (a referee call) belongs to.                                                                                                                                                                                                      | <i>Section 1 (role overview)</i>                                   |
| Q5       | A                | The CSA Manual explicitly requires getting the team's permission before connecting any of their Android devices (Control Hub, Driver Hub, or smartphone) to a volunteer's laptop. Once connected over Wi-Fi, 192.168.43.1:8080 is the management address for a REV Control Hub (whereas 192.168.49.1:8080 is used when an Android smartphone serves as the Robot Controller).                              | <i>CSA Manual (During the Event) / Robot Troubleshooting Guide</i> |

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| Q6  | B | A shared read on the venue's wireless picture, channel assignments, known issues, and spectrum conditions before the event lets the CSA tell "this is a known venue issue" apart from "this is specific to this team's robot" once problems start coming in.                                                  | <i>Section 2 (pre-event)</i>   |
| Q7  | B | The two steps serve different purposes: one confirms you're checked in as event staff, the other gets you oriented and briefed for the day. The roster step comes first because it's the standard sequence, not because of rank or convenience.                                                               | <i>Section 2 (arrival)</i>     |
| Q8  | B | The pits and queue are the CSA's primary station during match play because that's where the FTA sends teams whose field issues can't be resolved quickly, and where pit-side problems surface on their own.                                                                                                   | <i>Section 2 (event day)</i>   |
| Q9  | C | Match proximity drives CSA triage, because a missed match window can't be recovered the way a delayed conversation can. Honest ETAs to the other two, rather than silence, keep their trust while they wait.                                                                                                  | <i>Section 3, Scenario 3.2</i> |
| Q10 | C | The bar for confirming interference sits high on purpose. Correlation with spectrum activity doesn't prove cause, and a plausible story doesn't prove cause. Team-side causes get checked and ruled out first, because an unsupported claim can lead to an unfair match-replay decision in either direction.  | <i>Section 3, Scenario 3.3</i> |
| Q11 | B | Listening first, and meaning it, often surfaces information the CSA didn't have, like a recent hardware change. It also de-escalates the moment without asking the CSA to drop a well-supported diagnosis.                                                                                                    | <i>Section 3, Scenario 3.4</i> |
| Q12 | A | FIRST Tech Challenge rules no longer mandate safety glasses for simply walking through pit aisles. Safety glasses are required within individual pit stations where power tools are in use or robots are enabled/active. Unless the parent enters an active pit space without PPE, no intervention is needed. | <i>Section 3, Scenario 3.5</i> |

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| Q13 | B | Ping times reaching 250–300ms represent the threshold where a Driver Station is having extreme difficulty sending and receiving data to and from the robot. When operating on 2.4GHz, Bluetooth devices (like earbuds), rogue Wi-Fi hotspots, and microwaves share the same 2.4GHz spectrum and can degrade performance, whereas 900MHz walkie-talkies operate below 1GHz and do not interfere with 2.4GHz Wi-Fi.                                                                                                                                                                                                                                                                            | <i>Control System Troubleshooting Guide</i>        |
| Q14 | A | While this issue might be easy to blame on a wireless environment issue, more likely it is something else – like ESD on an untreated practice field and the robot lacking a grounding strap, placing the Driver Station on the floor instead of on a milk crate or table next to the field, or an electrical short that only reproduces when students carry the robot in a particular way. Once these possibilities have been exhausted, then look at the Driver Station configuration and whether or not there are remembered Wi-Fi networks – if the battery gets low the Driver Station may change networks (especially a remembered venue network!) looking for a stronger Wi-Fi signal. | <i>Section 5 (root cause categories)</i>           |
| Q15 | A | Distinguishing between an aborted OpMode and an actual Wi-Fi disconnect saves significant diagnostic time. Navigating away from the main screen of the Driver Station app immediately aborts the active OpMode for safety, but it does not drop the underlying Wi-Fi connection. True Wi-Fi drops typically trace back to low battery/brownouts or ESD events that cause the Robot Controller or Control Hub to reboot.                                                                                                                                                                                                                                                                      | <i>Control System Troubleshooting Guide</i>        |
| Q16 | C | When a fix runs longer than the time available, the right move is to communicate that clearly to the team and tell the FTA, not to hide the timeline or push through it alone.                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                               | <i>Section 5 (troubleshooting process, step 7)</i> |
| Q17 | B | A short check-in with the FTA closes the loop even without a formal report. If something is worth passing along, that's when it surfaces, and the FTA decides whether it belongs in a broader event summary.                                                                                                                                                                                                                                                                                                                                                                                                                                                                                 | <i>Section 1 / Section 2 (end of day)</i>          |

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| Q18 | B | Asking what happened, rather than why, keeps the team in the role of witness rather than diagnostician. Their description of the behavior becomes the CSA's starting point, uncolored by a guess that might send the investigation in the wrong direction.                                                                                                                                                                                                                                                                                                                                                                                                                                   | <i>Section 5 (scripts)</i>                  |
| Q19 | A | Swapped or reversed-feeling joystick behavior is one of the patterns CSAs see at almost every event, and it traces back to the gamepad's MODE button or the joysticks not being neutral when the gamepad was plugged in. Checking this first can resolve the issue in under a minute, before a longer investigation starts.                                                                                                                                                                                                                                                                                                                                                                  | <i>Section 5 (troubleshooting patterns)</i> |
| Q20 | C | Many teams do not realize that the in-line fuse on the battery is even there. Checking for a blown fuse any time the Control Hub refuses to even semi-power on when energized with a battery, or the battery charger does not recognize the battery is plugged in, should be the first step. As a follow-on, you may need to help the team find the short that is causing the battery fuses to blow or help the team determine if the fuse is naturally blowing because the actual current draw on the robot is just simply too high. Finally, recommending to the team that they can buy the fuses at a local auto parts store is solid advice, and to be sure to bring the fuse with them. | <i>Control System Troubleshooting Guide</i> |