

Robot Design Judge Certification Questions

1. Which of the following is allowed on *FIRST* LEGO League robots?
 - a. Duct tape
 - b. HiTechnic Gyro Sensor
 - c. EV3 Medium Servo Motor
 - d. Mega Bloks

2. What should you do if you suspect a team with extensive subroutines and variables in their code didn't do the programming themselves?
 - a. Rank the team low, since the team could not have done such sophisticated programming without adult assistance.
 - b. Rank the team high, since their programming skills are more advanced than most other teams
 - c. Ask the team to explain their programming in detail and describe how they came up with the ideas they included in their programs
 - d. Ask the team which adult programmed their robot for them

3. A team uses subroutines in their programming and has thoroughly and simply commented their code. At what level should they be marked on the rubric in the Programming Efficiency category?

Programming Efficiency Programs are modular, streamlined, and understandable				
N D	excessive code and difficult to understand	inefficient code and challenge to understand	appropriate code and easy to understand	streamlined code and easy for anyone to understand

- a. Beginning
 - b. Developing
 - c. Accomplished
 - d. Exemplary

4. A team's robot is programmed using timing to leave base, complete two missions, and return to base. Sometimes the wheels slip, interrupting timing of the program, causing inconsistent performance. They should be marked as "Developing" on the rubric in what category?

Mechanization Ability of robot mechanisms to move or act with appropriate speed, strength and accuracy for intended tasks (propulsion and execution)				
N D	imbalance of speed, strength and accuracy on most tasks	imbalance of speed, strength and accuracy on some tasks	appropriate balance of speed, strength and accuracy on most tasks	appropriate balance of speed, strength and accuracy on every task

Durability Evidence of structural integrity; ability to withstand rigors of competition				
N	quite fragile; breaks a lot	frequent or significant faults/repairs	rare faults/repairs	sound construction; no repairs
D				

Programming Quality Programs are appropriate for the intended purpose and would achieve consistent results, assuming no mechanical faults				
N	would not achieve purpose AND would be inconsistent	would not achieve purpose OR would be inconsistent	should achieve purpose repeatedly	should achieve purpose every time
D				

Programming Efficiency Programs are modular, streamlined, and understandable				
N	excessive code and difficult to understand	inefficient code and challenge to understand	appropriate code and easy to understand	streamlined code and easy for anyone to understand
D				

- a. Mechanization
 - b. Durability
 - c. Programming Quality
 - d. Programming Efficiency
5. When a team demonstrates a mission during the judging session, the robot comes apart easily. Pieces readily break off when encountering field walls and when the driver handles the robot. What level should the team should be marked at on the rubric in the Durability category?

Durability Evidence of structural integrity; ability to withstand rigors of competition				
N	quite fragile; breaks a lot	frequent or significant faults/repairs	rare faults/repairs	sound construction; no repairs
D				

- a. Beginning
 - b. Developing
 - c. Accomplished
 - d. Exemplary
6. A team describes how they divided into three groups to tackle the missions they thought would score the most points. In what category should this team be marked as “Accomplished” on the rubric?

Innovation Creation of new, unique, or unexpected feature(s) (e.g. designs, programs, strategies or applications) that are beneficial in performing the specified tasks				
N	original feature(s) with no added value or potential	original feature(s) with some added value or potential	original feature(s) with the potential to add significant value	original feature(s) that add significant value
D				

Automation/Navigation Ability of the robot to move or act as intended using mechanical and/or sensor feedback (with minimal reliance on driver intervention and/or program timing)				
N	frequent driver intervention to aim AND retrieve robot	frequent driver intervention to aim OR retrieve robot	robot moves/acts as intended repeatedly w/ occasional driver intervention	robot moves/acts as intended every time with no driver intervention
D				

Programming Quality Programs are appropriate for the intended purpose and would achieve consistent results, assuming no mechanical faults				
N	would not achieve purpose	would not achieve purpose	should achieve purpose	should achieve purpose
D	AND would be inconsistent	OR would be inconsistent	repeatedly	every time

Mission Strategy Ability to clearly define and describe the team's game strategy				
N	no clear goals AND no	no clear goals OR no clear	clear strategy to accomplish	clear strategy to accomplish
D	clear strategy	strategy	the team's well defined goals	most/all game missions

- a. Innovation
 - b. Automation / Navigation
 - c. Programming Quality
 - d. Mission Strategy
7. True or False? A team that does not accomplish their demonstrated mission during Robot Design Judging should be ranked lower than a team who completes a mission during judging.
 - a. True
 - b. False
 8. True or false?: It is acceptable to ask teams to split into builders and programmers during your Robot Design judging sessions.
 - a. True
 - b. False
 9. True or False? When a team is being considered for a Champions Award or a Robot Design award, Judges should do some additional investigation if their Robot Game score rank significantly differs from their rank in Robot Design judging.
 - a. True
 - b. False
 10. A team does not provide any information about their design process. What is the best practice for evaluating the team on the rubric for that category?

Design Process Ability to develop and explain improvement cycles where alternatives are considered and narrowed, selections tested, designs improved (applies to programming as well as mechanical design)				
N	organization AND explanation	organization OR explanation	systematic and well-	systematic, well-explained
D	need improvement	need improvement	explained	and well-documented

- a. During the judging session, ask the team about the missing information and mark the rubric appropriately based on their answers, and if the team still does not provide information, mark "ND" on the rubric for not demonstrated.

- b. After the judging session, mark the “Beginning” box on the rubric, since the team has not shown a higher level of accomplishment in that area.
 - c. After the judging session, mark the “ND” box on the rubric, since the team has not demonstrated anything in that category
 - d. After the judging session, find the team and ask them to provide more information about their design process and adjust your rubric evaluation accordingly.
11. What is the best way to re-word a comment on a rubric that says, “Your robot didn't work very well.”?
- a. Your robot used a lot of parts and didn't finish many missions.
 - b. Your team spent a significant amount of time on repairing the robot. You might want to research techniques to make your robot more durable.
 - c. The attachments for your robot were much too complicated and didn't work as intended.
 - d. Next time bring a robot that works.
12. What is the best way to re-word a comment under the Programming category the rubric that says, “Why didn't you use sensors?”
- a. You should have used sensors to more effectively navigate.
 - b. Consider using touch sensors or modifying your programs to better align the robot with mission models.
 - c. Change your programming so you can navigate better.
 - d. Pick different missions so that your robot has a better chance to complete them.
13. Which is the best example of a question you might ask a team to learn about their design process?
- a. How did you solve the greatest design or programming difficulty you encountered?
 - b. Why didn't you choose a design that would be better at driving straight?
 - c. What makes your robot better than other teams' robots?
 - d. Who gave you the design for your robot?