

version 2.0



RUTHUNA ROBOTIC CHALLENGE

SCHOOL CATEGORY





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1. Robot Specification

- 1.1 Dimensions of the robot should not exceed 20 cm x 20 cm x 20 cm (width x length x height). The robot should be fitted inside a box with dimensions of 20 cm x 20 cm x 20 cm.
- 1.2 The robot should be completely autonomous without any sort of remote control.
- 1.3 The interaction of the competitor with the robot is described later.
- 1.4 The robot should be supplied with an internal power supply whose supply voltage should not be more than 15 Volts and the final unit including the power source should be within the limit described in 1.1
- 1.5 The robot must be completely built by the team members. No off-the-shelf kits are allowed except the processing boards, sensor modules and drive gears.
- 1.6 The robot should not cause any damage to the gaming platform. Any kind of damage to the gaming platform leads to disqualification.
- 1.7 The robot should be activated using a single start switch which is placed on the robot itself.
- 1.8 The robot should be able to operate under any lighting conditions.

2. Game Task

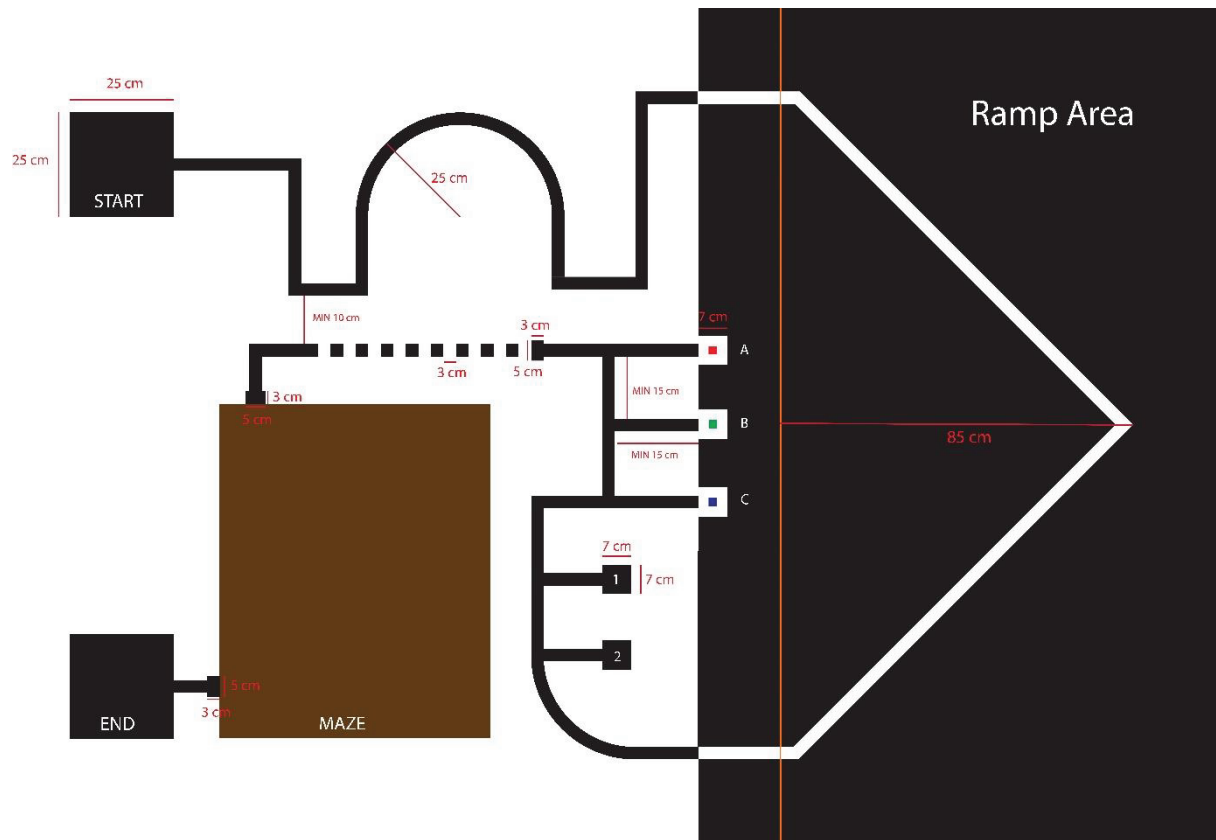


Figure 2.1 Sample Game Task

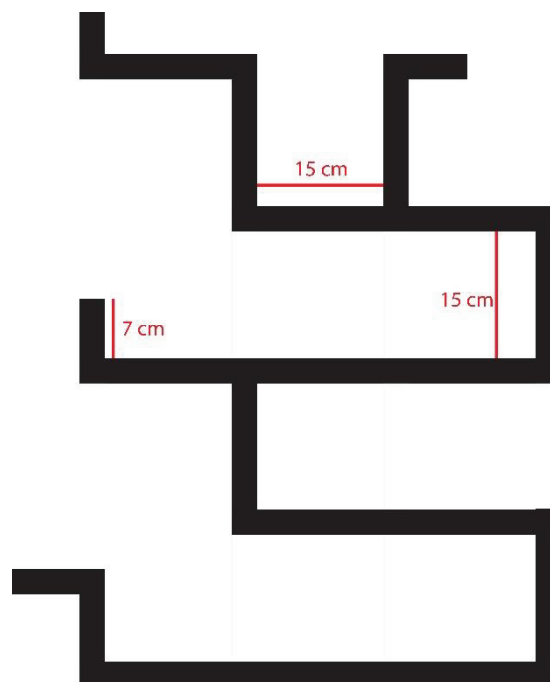


Figure 2.2 Sample Maze



- 1.1 The robot should be able to complete the given task while accurately tracking the course line from start to finish as fast as possible.
- 1.2 It should begin from the inside of the 'Start' square and should move fully autonomously by following the line to the inside of the 'End' square shown in Figure 2.1
- 1.3 The robot should be capable of adjusting its course according to the curvatures, and gaps of the path and should be able to take suitable decisions at junctions. (Minimum Radius of curvature will be 20 cm)
- 1.4 The robot needs to pass through the 10-degree angled ramp (Figure 2.1 Ramp Area). While climbing the ramp, it needs to follow the white lines illustrated in the figure. The robot will have to face a crossover while climbing the ramp.
- 1.5 Red/ Green/ Blue colored cardboard box with dimensions of 5 cm x 5 cm x 5 cm and weights of 10g to 20g are placed at positions 1 or 2. (See Figure 2.3)

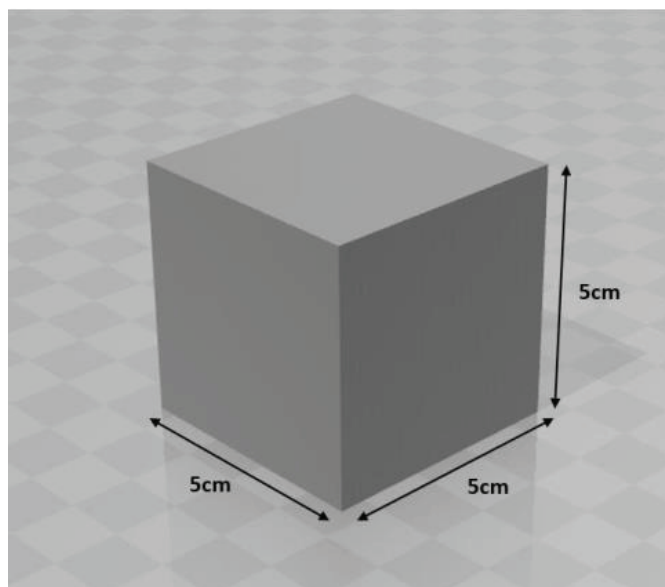


Figure 2.3 Box dimensions

- 1.6 The autonomous robot should identify the color of the box at position 1 or 2 and can pick or push the available box into the assigned place (shown in Figure 2.1) according to its color. But the method should not damage the arena or boxes.
Example:- If you got the red box at position 1 or 2, you should move it to the position where the red color box is assigned which is position A.
- 1.7 The robot must navigate through a maze and reach the end of the maze.
- 1.8 The arena contains a 5cm line width at the starting and ending point of the maze and before the dash lines. Apart from that line width will be 3 cm inside the arena.
- 1.9 A robot has to pass all the checkpoints in order to complete the task successfully. (Checkpoints are the points along the course line through which the achievement of the robot is measured)
- 1.10 Time is measured from the referee signal from the start until the robot approaches the exit area. A robot is deemed to have crossed the line when the forward-most part of the robot contacts or crosses over the line.
- 1.11 All the robots are collected 15 minutes before the competition, no more modifications are allowed after the collection.



3. Gaming Platform

- 1.1 The arena mainly consists of black lines on a white floor and also white lines on a black floor. The starting area and the exit area shall consist of white squares of 25 cm x 25 cm on a black floor. The line is 30 mm (+/- 3mm) wide. The start and the end points of the line course will be clearly marked via a transverse line.
- 1.2 The areas marked as 1 and 2 shown in Figure 2.1 would be 7 cm x 7 cm squares. One cardboard box will be placed either in position 1 or position 2.
- 1.3 The box is to be loaded onto areas A, B, and C shown in Figure 2.1 having dimensions of 7 cm x 7 cm.
- 1.4 The size of the arena is 300 cm × 200 cm.
- 1.5 The arena would consist of turns, crossovers (90 degrees), curves, and gapped lines as shown in Figure 2.1.
- 1.6 Start position to ramp area and Maze area in the arena will not be precisely what the robots will encounter at the contest, they are provided as general aids. The real arena would be disclosed at the time of the competition.



4. Game Rules

- 1.1 A maximum time of 10 minutes is given for any attempt in each round. The maximum number of attempts in a round is three for a team. Any robot that will fail to meet the maximum allowable time duration leads to disqualification. The best attempt is considered for grading.
- 1.2 During the commencement of an attempt, any interaction between the robot and the team members would be prohibited. If any interaction with the robot is detected, it is considered the termination of the attempt. Each new attempt should start from the starting point
- 1.3 The team can decide to stop the robot anytime and be credited with the distance traveled along the line and the time consumed until the robot stops.
- 1.4 Participating teams are always responsible for the safety of their robots.
- 1.5 The organization and the organizing team members will not be held responsible or liable for any incidents and/or damages to the robot caused by participating teams and/or testing and/or completing the task.
- 1.6 The team leader may forward their objections or doubts about the task and the game rules to the organizing committee. Then the organizing committee will attempt to these objections and doubts with the help of the judging panel.
- 1.7 If there is a tie between the robots, a run-off will determine the winner.
- 1.8 If nobody finishes the run, the one that reached the maximum number of checkpoints on the track wins.
- 1.9 There will be a technical inspection before every round.
- 1.10 All the robots are collected 15 minutes before the competition. No more modifications are allowed after the collection of robots.
- 1.11 The decisions taken by the judging panel will be the final decision. No objections shall be declared against the judge panels' decisions.



5. Team Specification

- 1.1 A team should consist of a maximum of 5 members from the same school.

6. Eligibility

Team members are eligible to participate in the event under the following conditions.

- 1.1 All competitors with valid recognition (by means of a student confirmation letter issued by the principal of the respective school) are eligible to participate in the event.
- 1.2 Competitors should be younger than 18 years to compete (The birth date can be proved by means of a letter issued by the principal, a birth certificate and National Identity Card (NIC))