

PRIZE MONEY
₹ 20000

ELIGIBILITY

All students with a valid identity card of their respective educational institutes are eligible to participate in the event.

Team Specification: A team may consist of a maximum of 5 members and minimum of 2 members. Students from different educational institutes can form a team. More than one team from one institute is allowed to participate.

OBJECTIVE

The event's basic purpose is to **build a cleaning robot**.

There will be two bots:

1. Autonomous Bot
2. Manual Bot

DESCRIPTION

At the starting point, the manual bot and the autonomous bot will already be there. The task of the manual bot will be to pick up the garbage and put it into the basket over the autonomous bot.

After collection of garbage is done, the participant will have to trigger the autonomous bot to dispose off the garbage. The bot will follow a line marked on the floor and dispose off the garbage at the specified endpoint. There are bonus points for use of smart methods like clapping of hands, verbal command etc. to trigger the autonomous bot from starting point.

Note: Garbage will be a piece of a plastic wrapper, small pieces of uncooked vegetables or a small ball-shaped piece of crumpled paper. Approximately, the size of each garbage piece will be the same as the standard Table Tennis ball.

Autonomous bot:

1. It should be a line follower robot.
2. It will also need to climb wedges. The dimensions of wedges are given below.
3. It would need some storage space (like a basket) with a lid. The lid must open and close automatically whenever the manual bot tries to put anything in the storage space.

Manually operated bot:

1. Movement of the robot and the robotic arm could be controlled manually.
2. The robot should also have one robotic arm with a gripper which can pick up things (here garbage) from one place and put it in the basket over the autonomous bot.
3. The bot should also be able to move from one place to another.

BOT SPECIFICATION

Autonomous bot

1. The autonomous bot must be completely autonomous with just one switch to start/ reset it and to calibrate the line follower.
2. The dimensions of the autonomous bot are such that it completely fits in a box of

dimensions 25cm X 25cm X 25cm (l x b x h). The bot must be started individually by only one switch. However, a team may have an onboard switch for restart. This switch has to be shown to the organizer before the run.

3. Weight of autonomous bot should be less than 3 kgs.

4. The bot should not damage the arena when running or performing any task. It should also not damage the line of the line following path. If someone is found doing so, the team will be disqualified or penalized. The decisions rest on the organizers and will be final and binding for all.

5. Teams are not allowed to use readymade Lego kits or any such assemblies.

6. The starting procedure of the bot should be simple and should not involve giving manual force or impulse to the bot in any direction.

Manual bot

1. Teams can use both wired as well as wireless remotes. In the case of wired bots, the length of wire should be such that it always remains slack at any instant of time. If the participants use wireless mechanism, then it is mandatory to use a dual-frequency remote. If someone wants to control the robot with the help of mobile using Bluetooth, they are allowed to do so. However, the team should first show it to the organizer, i.e. what controls are there in the mobile and how they are working.

2. Only one member of the team is allowed to control the bot. And only two members including the one operating the bot are allowed to enter the restricted area.

3. The manual bot must fit within a box of dimension 30cm x 30cm x 30cm (l×b×h). The size of the arm, gripper and the external remote control used to control the bot is not included in this constraint.

4. Weight of the manual bot excluding the weight of the battery should be less than 3 kgs.

5. The bot must be stable and should be able to stand on its own at the beginning of the run when put on the first checkpoint. Bots not fulfilling these criteria will be disqualified.

6. The manual bot should not split into two or more units during the entire match. This bot also should not damage any part of the arena when running or performing any task. If someone is found doing so, the team will be disqualified or penalized. The decision rests on the organizers and will be final and binding for all.

7. The manual bot should have an onboard power supply.

8. The team cannot construct their manual bot out of readymade mechanism or Lego kits. However, readymade gear assemblies are allowed to use. Violating this clause will lead to disqualification of the team.

Power supply:

1.) Both the bots must use an onboard power supply. No external power supply will be allowed. Organizers will provide the power supply plug or any extension board if required.

2.) The potential difference between any two points should not exceed 24V DC.

Arena specification:

1. Total dimension of the arena: 200cm X 200cm (l x b).

2. Width of the line for line follower robot: 3cm

3. Length of the line to follow till the first checkpoint: 40 cm

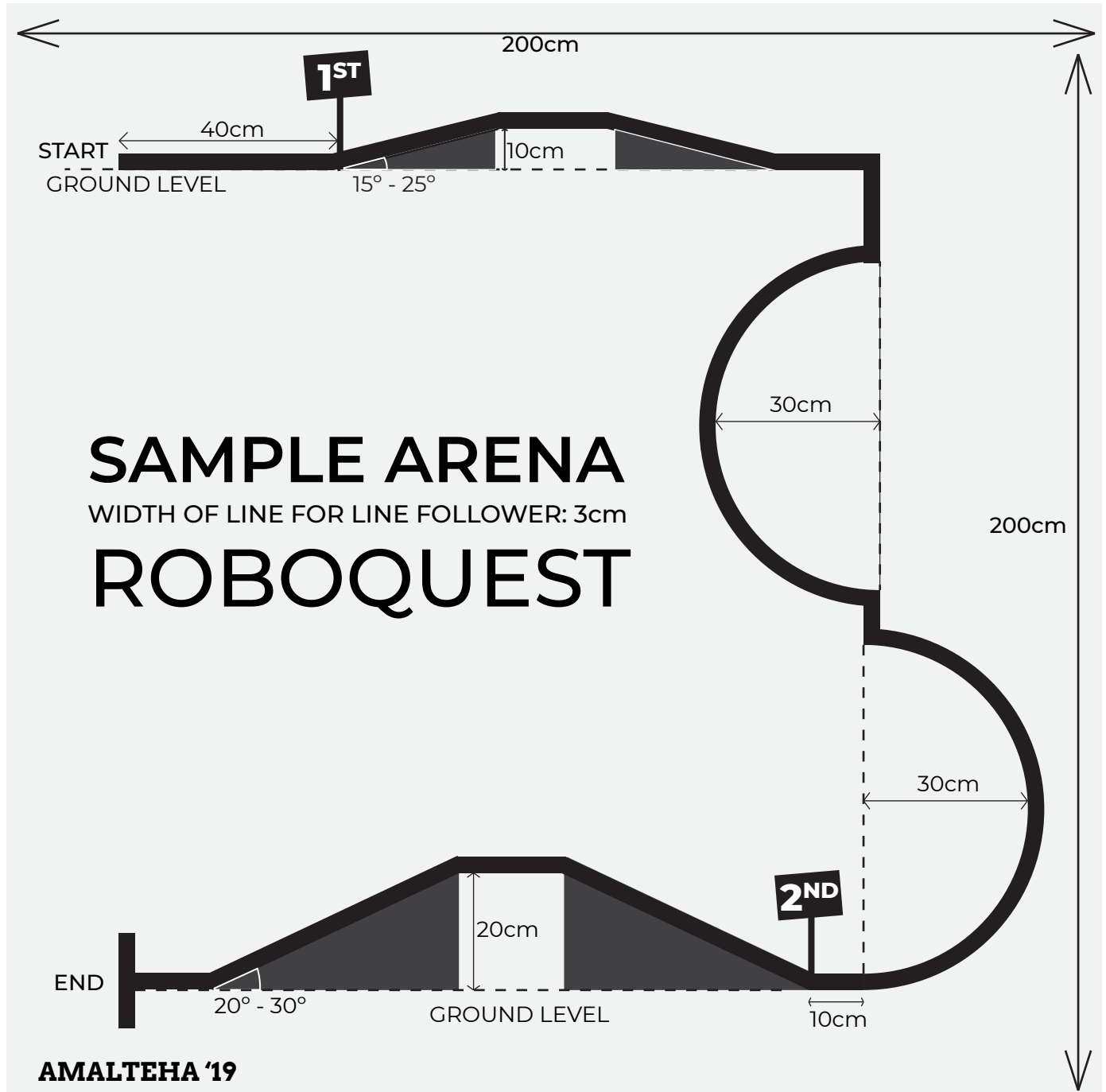
4. First checkpoint:

i. Wedge height: 10cm

ii. The inclination of the wedge from the ground: approx 15-25 degree

iii. Two semi-circular curves of radius: greater than or equal to 30 cm.

5. 10cm from the end of the second circular curve will be the second checkpoint.
6. Second checkpoint:
 - i. Wedge height: 20cm
 - ii. The inclination from the ground: approx 20-30 degree
7. Width of wedges - 60 cm
8. The radius of the TT ball(garbage) - less than 2 cm
9. Total weight of the garbage as a whole: less than 300 grams.



POINT SYSTEM

1. Picking and keeping things with the help of robotic arm only: Point system is as follows- [Note: Equal points will be awarded for picking and putting]
 - o Picking and keeping the ping-pong ball in the basket – 25-25 points*
 - o Picking and keeping uncooked food in the basket – 20-20 points*
 - o Picking and keeping a piece of crumpled paper in the basket – 15-15 points
 - o If the bot is not able to pick up a piece of garbage in less than or equal to 3 attempts, then that garbage piece will be considered as skip.
2. Points will be awarded only on successful pickups and placements.

3. Line following until first checkpoint - 20 points
4. Line following from the first checkpoint to the second checkpoint- 43 points
5. Line following till final checkpoint from the second checkpoint- 40 points
6. Unloading of garbage using automatic dump trailer mechanism- 18 points
7. Bonus-
 - o If the autonomous bot starts due to the clap sound or verbal command- 20 points
 - o Time bonus-10 point.Fix for whatever time a participant saves greater than 10 seconds; if he saves less \ than 10 seconds, he won't be awarded any bonus points.

NOTE: In case of any tie, a team with minimum time score will be the winner.

RULES AND REGULATION

1. If you are not able to complete the task, you can skip that particular task. At max, you can skip two tasks. If someone skips more than two tasks, he won't be considered as an eligible candidate to win the prize. But still, if he completes at least 3 tasks successfully, he will receive a participation certificate.
2. You have to perform all the tasks in a fixed amount of time. Points will be given to you based on the tasks you would be able to complete successfully.
3. If a team completes all tasks before the given time, then he will be given bonus points. (If you skip even one task you won't get any bonus points)
4. In between the two checkpoints If malfunctioning of the autonomous bot occurs; and is not able to move any further, then points will be counted only up to the previous checkpoint.
5. Use of any unfair means would lead to disqualification.
6. There will be one boundary near the arena. When someone is performing the task, only that team will be allowed to enter in that area.
7. We will enter all team's data in the excel sheet. Teams will have to perform in the randomly generated order. The team has to report in 10 minutes on their name call; otherwise, the organisers reserve the right to disqualify them.

CERTIFICATE POLICY

1. Certificate of excellence will be awarded to the top 2 teams.
2. Certificate of participation will be given to all the teams whose robot has completed at least three tasks successfully except the top 2 teams. (All the members of the team will be given certificates)
3. Disqualified teams will not receive any certificate.

IMPORTANT NOTE

1. The organizers reserve the rights to change any of the above rules as they deem fit. Change in rules, if any, will be highlighted on the website and notified to the registered teams.
2. You are strongly advised to check the website for updates regularly.
3. In case of any disputes/discrepancies, the organizers' decision will be final and binding.

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AMALTHEA '19
19 - 20 OCTOBER