IIITDM, KANCHEEPURAM, RoSMa 2018

Presents

R FOR RESCUE

STAGES OF THE EVENT

1) Day 1: Presentation Round: Presentation of team discussion progress by each team showcasing the designs of each robot.
2) Day 2: Control round: The robot need to pass certain obstacles in its path by seeing the projection of the camera fit on it. The robot should be operated manually by the participant at the control room from where the track will be visible only via the camera installed in the robot and the camera focuses the top-view of the arena.
3) Day 3: Auto Round: The same robot should be made autonomous and pass through a tunnel. At the end of which it is supposed to detect humans whether they are dead or alive.

BOT SPECIFICATIONS

- Bot dimensions: 300mmx400mmx400mm (lxbxh) maximum.
- The weight of the robot should not exceed 5kg (including the battery weight).
- Robot should be electrically actuated and a maximum of 24 V onboard batteries can be used.
- Wheeled, Wireless robot.
- Equipped with a wireless camera gives vision of the track for the operator.
- Readymade mechanisms or parts and Lego kits are not allowed. Readymade gears, shafts however may be used.

TEAM SPECIFICATIONS

* A team can consist of a maximum of Three members (2 members will be control room and 1 member can stand near arena).
* Students from different universities can form a team.
* Participants must have a valid identity card of their respective educational institution.

PLAN OF OPERATION

Presentation Round: For the presentation round the participants are expected to prepare the PowerPoint presentation that includes construction, working, CAD model, Expenses incurred etc. and the participants are supposed to display their robot during presentation.

Control Round: The robot will be placed in the Home position. It needs to traverse the path mentioned below. The person operating the robot will be occupying the control room and the operation will happen with the help of the video streamed from the camera which is installed on the robot.

Auto Round: The next operation is inside tunnel and autonomous part of the robot is used to follow the wall of the tunnel, avoiding obstacles in its way. The end of the tunnel it finds another path to follow which ends up near a chamber with a human body. It should check if the person is dead or alive and send a message to control room. Finally reach the ending point.

Arena Specifications

The dimensions mentioned here subjected to minor changes with 5%error.
The path width for both the round will be 600mm.
All dimensions mentioned here are in mm.

- **Control Round**

  The robot should pass through obstacle/tests/tasks like

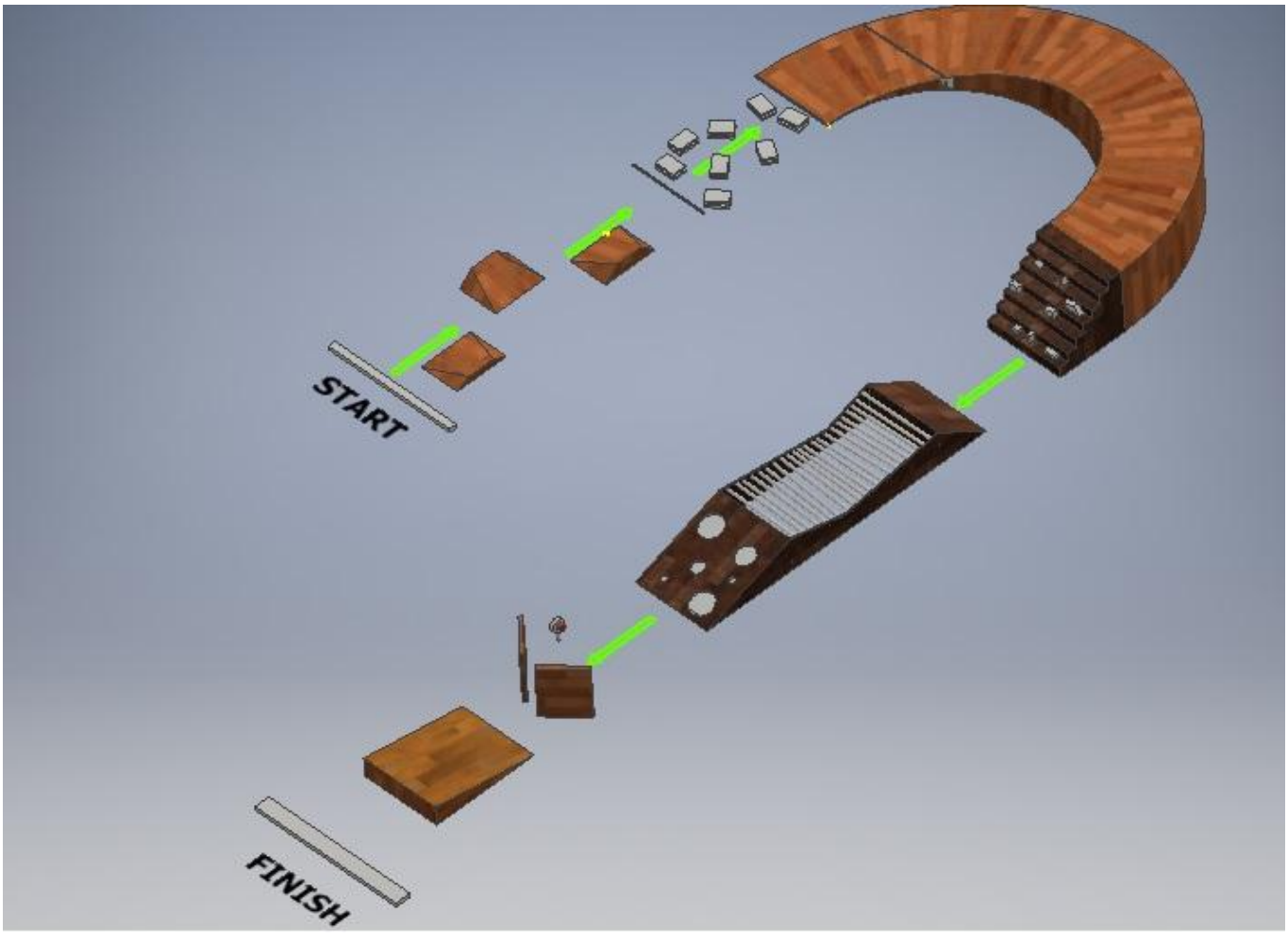
  1) **Wobble test**: Alternate bumps are made where at a time only one will be at a particular height. The heights of each bump may vary from 50mm to 100mm. Half the path width will be filled alternatively by each bump.
  2) **Random pieces**: Controller can choose to whether to avoid the obstacles or pass over them. The obstacles will be relatively small size for a robot with the specified dimension to pass through.
  3) **Firing Turn**: Sandy area for a small part where the elevation starts and there are two firing places on the way to the top. The robot should wait for the right time to get past the fire.
  4) **Staircase**: Climb down the stairs which has certain obstacles.
     Step size: 600mm wide, Riser height: 70mm, tread width: 70mm
  5) **Rolling pipes**: Pipes will be attached with the bearing hence providing rotation.

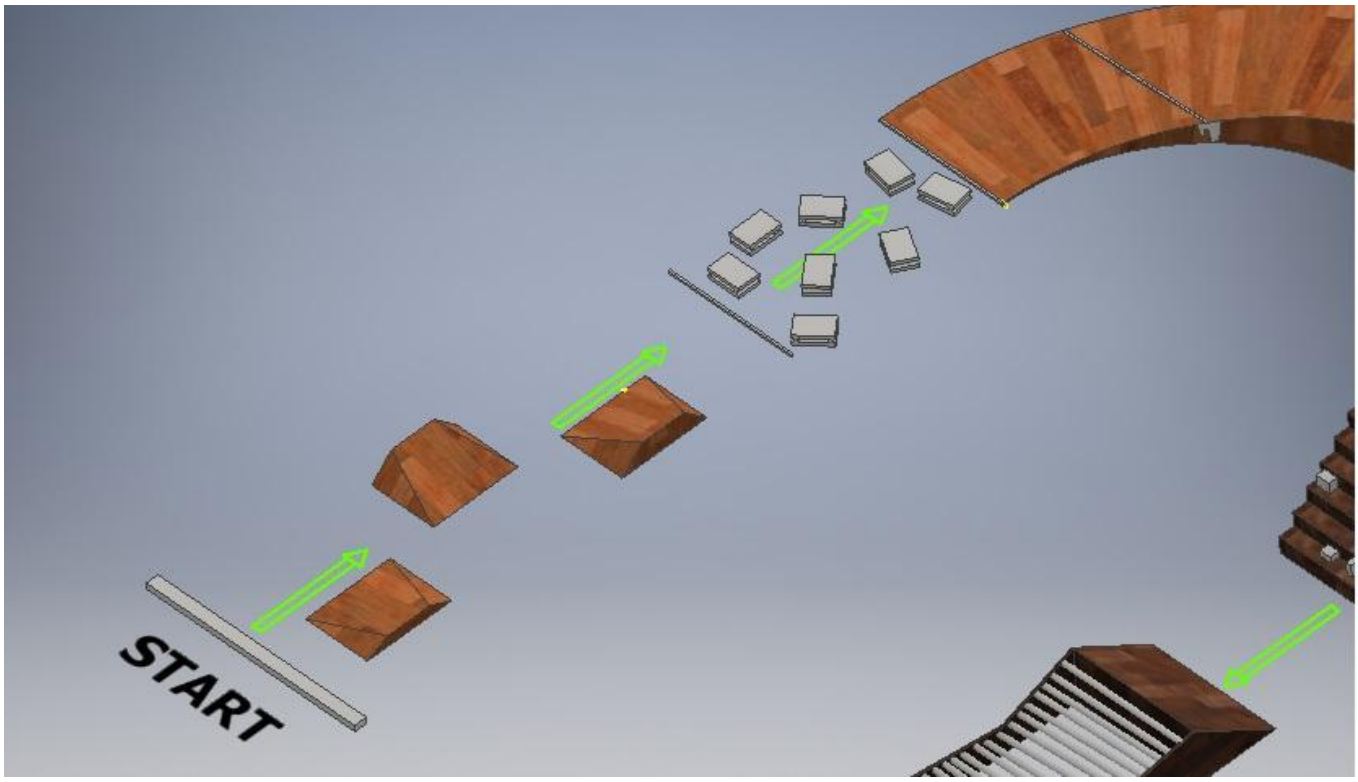
6) **Stepping Stones**: The declination of the rolling pipes will contain surprise depths.
7) **Press to go**: A button will be on the side wall which should be pressed to open the door. The door will be closed in after few seconds, before that the bot has to pass through the door to reach the finishing point.
8) **Drop test**: After the door, an elevation is present, which will take the robot to a height of 150mm from where the robot should fall down for drop test. This checks it durability and how well packed its design is.

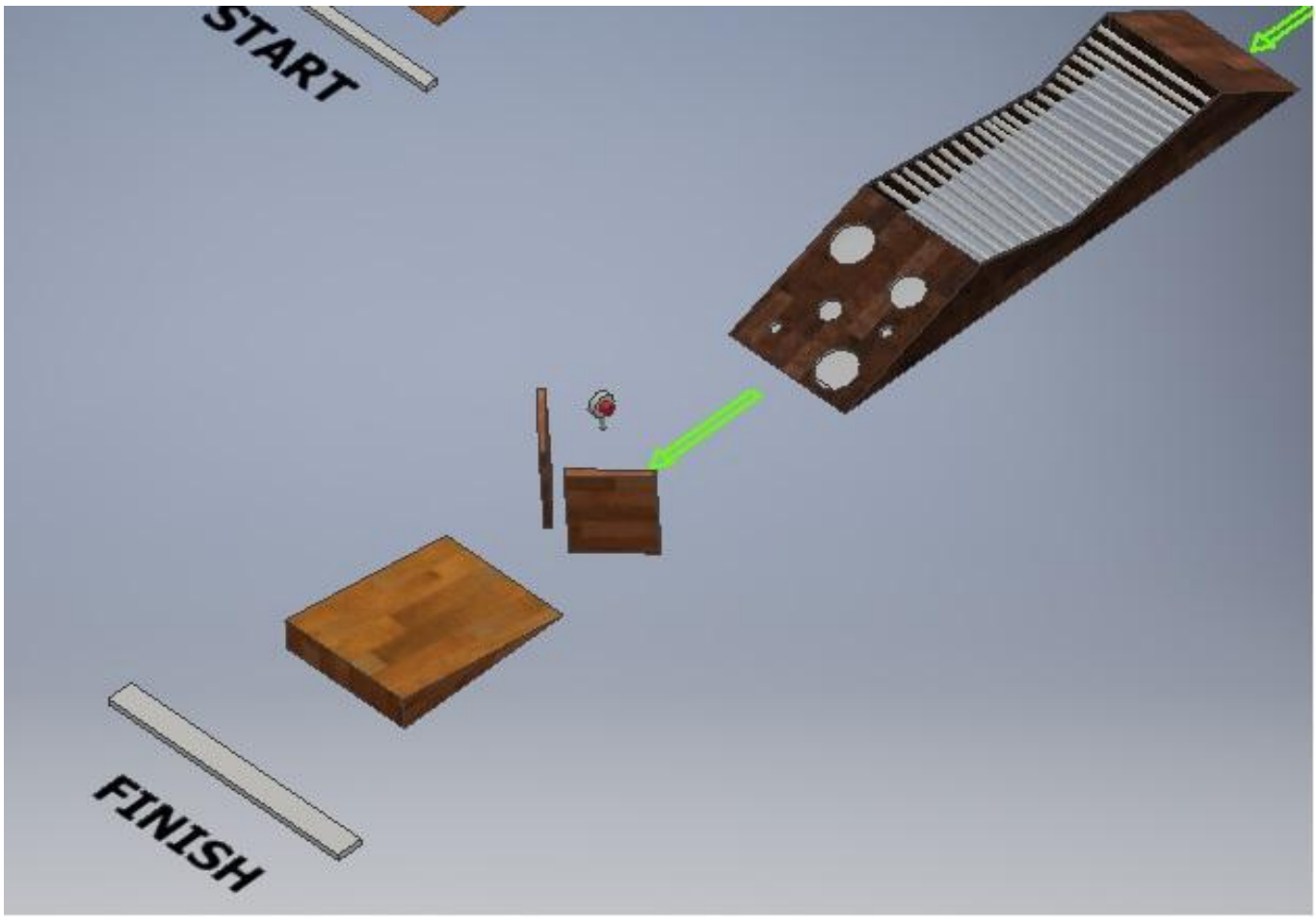
Note: there will be checkpoints prior to every obstacle.

- **Auto Round**
  1) **Tunnel:** The tunnel has a 600mm path inside and also a declination with a few obstacles. The robot has to wall follow the tunnel and also avoids obstacles on the path.
  2) **Human Detection:** Once the robot reaches the end of the tunnel, a black strip will be present. These black strips are to be detected and whole operation is to be switched to line follower. Then it has to reach two chambers following the line and detect human if there are dead or alive.

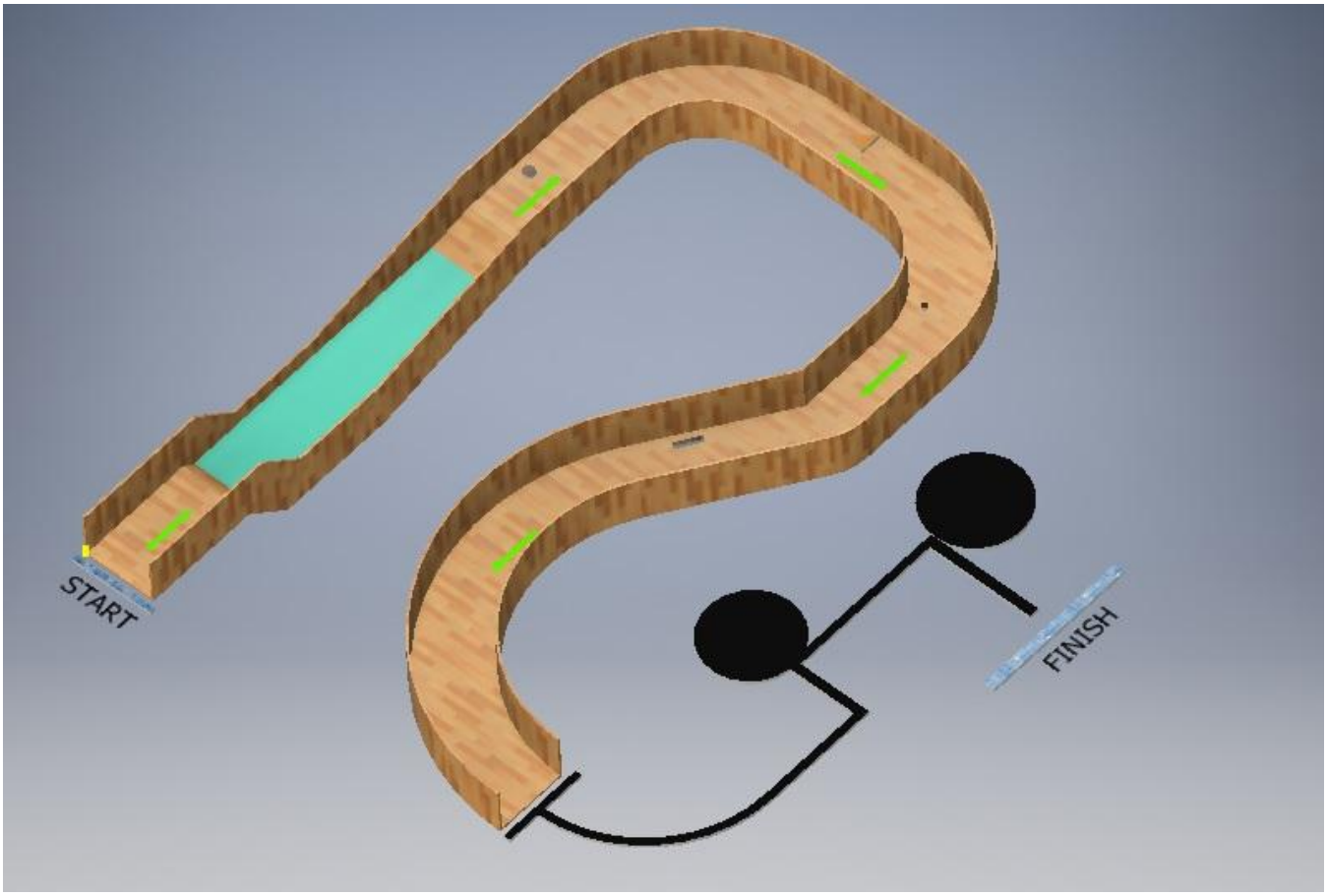
MODEL OF THE ARENA



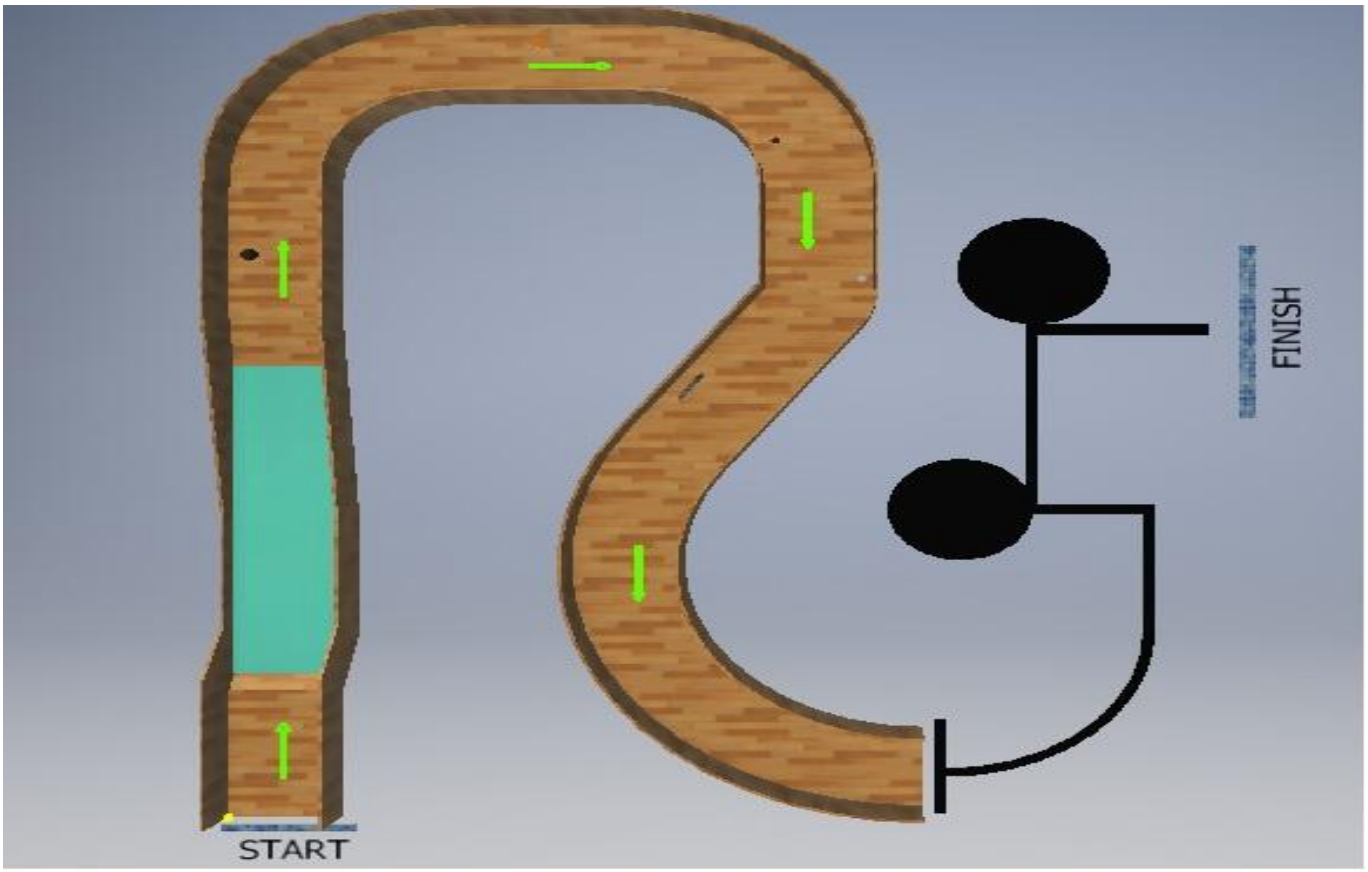

START


START
FINISH

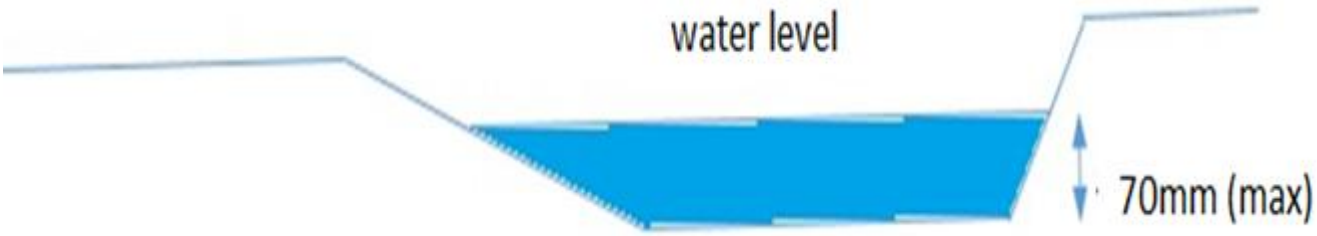
COMPLETE VIEW OF THE ARENA: AUTO ROUND



TOP VIEW



INCLINATION WITH WATER



POINTS

- On the successful completion of the tasks the corresponding points will be awarded (refer the table below)
- If the bot topples or loses control in the middle of any land conditions, a reset at the previous checkpoint is done with a **loss of points.**
  First reset – 20 points
  Second reset – 40 points
  Third reset – 60 points
  And so on…
- Negative points for damaging arena.

CONTROL ROUND

* Awards:

S.No.	TASK	POINTS
1.	Wobble test	100
2.	Random Pieces	100
3.	Sand	100
4.	Firing Turn	100
5.	Staircase	100
6.	Rolling Pipes	200
7.	Press to go	200
8.	Drop test	100
	TOTAL	**1000**

* Negative points:
  Toggling at any obstacle: 20 points for each toggle.
  Damaging arena: 10 points for each.
  Skipping any task: 120 points.

AUTONOMOUS ROUND:

* Awards:

S.No	Tasks	Points
1.	Completing Tunnel	100
2.	Switching to Line Following	200
3.	Human Detection.	300
	TOTAL	**600**

* Negative points:
  Skipping any of the tasks: 150
  Damaging arena: 10 for each count.

GENERAL RULES

* Only 2 participants are allowed to control the Manual bot.
* Dimensions should be restricted to the measurements mentioned above; there will be a dimension check before the start of the event.
* There shall be a countdown preceding the start of the race. No participant is allowed to touch the machine during the countdown period.
* The bot is not allowed to leave any loose parts on any part of the arena.
* **RESET** - The path will have checkpoints after every obstacle. If a machine tumbles, halts or goes off the arena at any point on the path, only the volunteers are allowed to lift it up and place it at the previous checkpoint with

the consideration of negative points. The time shall still be running in the meantime.

* **Time-out** - There will be a time-out allowed per team exactly once during the round. If the team calls for a time-out, the timer for that round will be paused and the team will get a maximum of a minute to place the robot back at the last reset point it has crossed after which the timer will be un-paused and the bot must complete the rest of the path from the previous checkpoint.
* **Skipping** a checkpoint will be allowed only when the bot tries to overcome the obstacle for two minutes or more by gaining negative points.
* Other communication devices are not allowed (including other RC remotes) near the arena while the competition is on. This includes remote control of your bot while some other team's run is on. The organizers hold the right to check for these devices and their usage.
* The time measured by the organizers will be final and will be used for awarding points. Time measured by any contestant by any other means is not acceptable for scoring.
* No disputes would be entertained on any issue. The decision of the Organizers is final and binding in all circumstances.
* The organizers reserve the rights to modify the above rules. Any change in rules will be highlighted event page on ROSMA 2018 Webpage.

DISQUALIFICATION

A team will be disqualified if it commits any of the following actions during the match: (Decision rests solely with the organizers)

* The team fails to obey the instructions given by the volunteers.
* If the team has made false start for 2 times in the same match.
* The team performs any acts that are not in the spirit of play.
* The team damages the arena or opponent's bot intentionally or unintentionally.
* Any team with completely purchased machine.

Note: Registration and Prize details will be updated in the website.

CONTACT US

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