MAZE -RUNNER

About :-

· Develop an autonomous robot for rapid navigation on a course marked by black lines on a white background or white lines on a black background.

· Prioritise swift progression from the starting line to the finishing line.

· Implement reliable line detection to ensure the robot consistently follows a specific line throughout the course.

· Emphasise speed and accuracy, aiming for the shortest completion time while maintaining ownership of the designated line.

Track:-

There will be one **START** point and one **FINISH** point in the entire arena.

A designated end zone in the arena is marked by the presence of a black box, indicating the conclusion or endpoint.

The width of all black stripes will be **2 inches.**

The black lines in the path form right angles with each other.

· The track will be released on the day of the event on the spot.

Checkpoint :-

- The track will be segmented into x sectors: A, B, and C.
- Every checkpoint is worth 25 points.

Bot Specification :-

The autonomous bot needs to be able to fit inside a box with dimensions of 25 cm by 25 cm by 25 cm.

While operating, the autonomous bot must avoid causing any harm or damage to the arena. It is strictly prohibited from leaving any residues or creating marks while navigating through the arena.

Use of lego parts and ready-made bots is not allowed.

Game Play:-

The competition involves two phases: the **"Dry Run"** and the **"Actual Run".**

    I.   **During the Dry Run :-**
      a. The robot navigates from the 'Start' to the 'End,' using an algorithm to find the optimal path and storing directional information in its memory.
      b. There are no restrictions on covering all checkpoints during the Dry Run exploration.

    II.   **During the Actual Run :-**
      a. In the Actual Run, the robot starts again from the 'Start' and follows the most efficient path based on the stored information from the Dry Run.
      b. The 'End Zone' is marked by a black box, indicating the endpoint.
      c. Each checkpoint along the path carries 25 points, with variable locations in the actual arena.

- Teams have **4 minutes** to complete the Dry Run and **3 minutes** for the Actual Run.

- Any excess time taken during the Dry Run beyond 4 minutes is deducted from the 3-minute time limit for the Actual Run, promoting strategic planning and efficient execution.

- Teams are allowed a limited time for testing before the actual race as determined by the coordinators.

- Once on the track, a maximum of **8 touches** is permitted to reset the bot on the right track, with a penalty of **5 seconds** per touch added to the total time.

- The winner is the team finishing the track in the shortest time; if no team finishes, the prize goes to the team covering the most of the track in the least time with minimum touches.

- Judges' decisions are final at all times.

Rules:-

- Timely arrival is mandatory; failure to comply results in elimination with an option to rejoin upon payment of a designated fee.

- The Line Follower Bot must be fully self-contained, without external wire or remote radio control during the race.

- Any bot damaging the arena will be disqualified, and the organisers have the final say.

Robo-Clench

About :-

- Construct a remote-controlled robot designed to grip objects effectively.

- Strategically position gripped objects to navigate and complete the obstacle course.

- Teams can opt for wired or wireless bots.

- Wired bots must feature a cable of at least 2m to maintain slack during operation.

Scoring :-

Points earned for completing a task are represented by 'A'.

Penalties incurred during the competition are denoted by 'P'.

Time taken, converted to seconds, is represented by 'T' and calculated as (360 - Time taken in seconds).

The overall points for a team are determined by the formula: TOTAL POINTS = A + T - P.

The team with the highest total points will be declared the winner.

Penalty :-

1. Any interference involving touching the robot or manipulating its attached wire during an obstacle incurs a penalty of 10 points.
2. Crossing the designated track limits results in a penalty of 10 points for the robot.
3. Opting to skip an obstacle comes with a penalty of 20 points.

Bot Specification :-

1. The robot's dimensions must be within 300mm x 200mm x 300mm, with a permissible error of ±5%. It can extend its dimensions once the race starts. Failure to meet this criterion results in immediate disqualification.

2. Control your robot using either a wireless remote or a wired one throughout the entire race.

3. Ensure that your robot's weight does not exceed 3 kg.

4. For wired robots, maintain a minimum 2-metre slack in the wire at all times during the race. Properly insulate the wires, and no physical transmission of power from the operator to the robot is allowed. Violating these rules will lead to immediate disqualification.

5. The robot should fit into a box of dimensions 300mm x 210mm x 300mm, including all extensions. Failure to comply results in instant disqualification.

6. Control the robot manually, using either wired or wireless mechanisms.

7. Keep the robot's weight under 3 kg.

8. For wired robots, ensure the wire remains slack throughout the race, with proper insulation and no physical power transmission from the operator. Failure to meet any of these specifications leads to immediate disqualification.

Game Play:-

1. Teams will earn points in this competition, and they must navigate the course within a 6-minute time frame.
2. The robot must kick off its mission from the designated START point once the timer is set in motion.
3. Tasks involve the robot grasping square blocks, ascending ramps, and strategically depositing the blocks for points.
4. Points are awarded for successfully completing each obstacle task, but there are penalties for opting to skip tasks.
5. Teams are allowed to skip just one task or obstacle, but failing to complete the remaining tasks results in elimination.
6. If the robot makes a mistake or topples over, it must backtrack to the previous checkpoint to restart, and the timer keeps running without pause.

Rules:-

1. Only one team member is permitted to handle the robot, and no other team members are allowed to enter the arena.

2. The robot risks disqualification if it causes any damage to the arena during the competition.

3. Sliding blocks against the ground is prohibited, except for fine adjustments in the Deposit Zone.

4. Immediate disqualification will occur for any damage done to the blocks.

5. All decisions regarding scoring, gameplay, timing, and participation made by the Organizing Committee are deemed final.

DRONE DRAG

About :-

1. Successfully navigate a drone through a designed obstacle course.
2. Simulate real-world scenarios to mirror challenges faced by drone operators.
3. Test drone operators' skills in obstacle navigation to achieve mission objectives.

Scoring :-

People in the competition get points for how fast they finish and how many obstacles they go through. The person with the most points at the end is the winner.

Checkpoint :-

The challenge for the drone involves going through a path with gates and obstacles. This path is like a course and will be set up in a specific area of the college campus.

Drone Specification :-

Participants can use any type of drone for the event, as long as it meets the following requirements:

1. The drone should weigh no more than 5kg.

2. The drone must be able to move easily in tight spaces and make quick turns.

Rules:-

1. Keep your drone in sight at all times.

2. Avoid flying your drone higher than 40 feet.

3. Do not fly your drone over people or buildings.

4. Refrain from interfering with other participants' drones.

5. Prioritise safety to ensure a smooth and secure event for everyone.

Participants could be removed from the event if they don't follow the rules or if their drone causes harm to property or hurts someone.

ROBO SOCCER

About :-

- A manually controlled robot has to push the ball in the opposite team's goal post.

- And also defend the opponent from pushing the ball in their own goal post.

- Teams can opt for wired or wireless bots.

- Wired bots must feature a cable of at least 2m to maintain slack during operation.

Scoring :-

Each Team has to score maximum goals (each goal will add +1 point to the score).

Bot Specification :-

1. The robot's dimensions must be within 300mm x 300mm x 300mm, with a permissible error of ±5%. It can extend its dimensions once the race starts. Failure to meet this criterion results in immediate disqualification.

2. Control your robot using either a wireless remote or a wired one throughout the entire match.

3. The machine must not be made from Lego parts, or any ready-made assembly kits.

4. Ensure that your robot's weight does not exceed 5 kg.

5. For wired robots, ensure the wire remains slack throughout the race, with proper insulation and no physical power transmission from the operator. Failure to meet any of these specifications leads to immediate disqualification.

Game Play:-

1. Each round consists of 2 halves each of 2 min.

2. There will be a side switch after half time.

3. If the ball goes out of the arena it will be placed in the centre and the match will resume.

4. Incase of damage to the robot, a team can claim their repair time of 1 min. Failing to repair the bot within the time limit will lead to negative points.

5. The team scoring the greatest number of goals will be declared the winner.

6. In case of tie, 3 penalties will be given to each team.

Arena:

1. The arena dimensions are__ feet in length and __ feet in width. And made up of wooden ply.

2. The arena has a __ cm wide goal post on either side.

3. The arena is bounded from all sides.

Rules:-

1. Each team can have a maximum of 4 team members.

2. Timely arrival is mandatory for all teams. Failure to comply will result in elimination, with the option to rejoin upon payment of a designated fee.

3. Only one team member can control the robot. All other team members must remain outside the game zone.

4. In case of disputes or discrepancies, the organiser's decision is final and binding.

5. All decisions regarding scoring, gameplay, timing, and participation made by the Organizing Committee are deemed final.

6. Teams must respect and adhere to the decisions made by the committee.

RUSTY WHEELS

About:

A robot, operated manually and wirelessly, is required to navigate through a track filled with twists and obstacles in the shortest time possible.

Track:

1. Establish a single Start and Finish line for the race.

2. Allow for an uneven grassy ground surface as the track, with the specific course design kept undisclosed until the event.

3. Include obstacles on the racetrack designed to impede the robot's progress.

4. Facilitate multiple machines racing simultaneously on a single-lane track in some or all rounds.

5. Define a completed lap when the machine returns to the Start-Finish line.

6. Acknowledge that despite efforts to maintain track quality, wear and tear may occur as cars run over it. The robot should be capable of performing on such a weakened track.

Bot Specification:

1. Ensure that the dimensions of the robot do not exceed 700mm x 300mm x 250mm (length x breadth x height), as surpassing these dimensions will result in disqualification.

2. Allow for a permissible error of ±5% in the specified dimensions.

3. Restrict the use of wheels in the event to only Nitro-based RC wheels.

4. Use of Lego parts and ready-made bots is not allowed.

Game Play:

1. Position the robot at the starting line.

2. Initiate the robot's movement when the timer begins.

3. Ensure the robot stays on the designated track; otherwise, it must restart from the last checkpoint crossed, with the timer continuously running.

4. Stop the timer immediately upon the robot crossing the finish line.

5. Specific details regarding scoring, penalties, and rules will be communicated on the day of the event.

Exhaust Rules:

1. All vehicles must be equipped with a muffler or tuned pipe for the passage of exhaust gas.

2. Ensure secure mounting of fuel tanks.

3. Adhere to maximum fuel system capacities, set at 125cc, with a maximum engine capacity of 3.5cc.

Engine Rules:

1. Only single-cylinder, two-stroke engines that are normally aspirated, air-cooled, and use glow-ignition are allowed.

2. Prohibit forced aspiration systems, including liquid cooling systems or fuel pressurisation, except for exhaust pressure applied directly to the vehicle's fuel tank.

3. Allow the use of any carburetor, as long as the bore does not exceed the maximum allowable for the engine size.

4. Permit the use of restrictors to achieve the legal diameter, but these must be securely fastened in place.

Transmission & Drive Rules:

1. Limit to single-speed transmissions only.

2. Allow either 2WD (two-wheel drive) or 4WD configurations.

3. Mandate independent rear suspension.

4. Specify the body style to be a buggy or a similar off-road design reminiscent of actual off-road racing vehicles.

5. Verification of all specifications will be carried out by CEAR.

6. Clarify that CEAR will not assume responsibility for any unavoidable disqualification resulting from behavioural or technical ambiguity.

Rules:

Team Structure:

1. Allow a maximum of 4 members per team.

2. Designate one team member as the robot handler.

3. Only the designated handler has permission to control the robot during the game.

4. Enforce that all other team members must remain outside the game zone.

5. Participants engaging in misbehaviour may be asked to leave the competition area, risking disqualification.

Fair Play and Disqualification:

6. Disqualify robots or participants deliberately causing interference with other robots or damage to the arena.

7. Decisions regarding scoring, gameplay, timing, and participation made by the Organizing Committee are deemed final.

General Rules:

8. Prohibit machines from leaving any loose parts in any part of the arena; disintegration during the race results in disqualification.

9. Restart the counter if any machine starts off before the flag is waved, providing a second chance.

10. Disqualify any machine starting off prematurely for a second time, with no rematch held for the second occurrence.

11. In cases of disputes or discrepancies, the decision of the organisers and judges is final and binding.

Robo Wars

About :-

Robo-Combat stands as a prominent combat robotics event centred around the creation and production of robots engineered for the purpose of annihilating adversaries while prioritising their own safety. Victory is determined by the extent of destruction inflicted upon opponents. In the 15 kg category, robots will engage in fierce battles, showcasing their destructive capabilities to emerge victorious.

Arena:-

1. Shape and Dimensions:

- The arena is rectangular in shape.

- Dimensions: 18 x 16 x 10 feet.

2. Safety Wall:

- The side safety wall is constructed from M.S. (Mild Steel).

- The height of the safety wall is 0.5 metres.

3. Height Above Safety Plate:

- Above the safety plate, there is a polycarbonate plate forming a protective barrier.

- The height above the safety plate is enclosed within a cage structure.

4. Cage Cover:

- The top of the arena is covered with a cage structure.

Note: The provided dimensions and materials are critical components ensuring the safety and integrity of the arena during competitions.

Game Play:-

- Prior to each match, robots will undergo rigorous testing for compliance with dimensions and safety standards.

- Both bots must be positioned within their respective starting zones before the match begins.

- Each match comprises 2 rounds, each lasting 5 minutes. The winner will be determined based on predefined criteria.

- No mechanism of the bot is allowed to start before or after the match inside the arena.

- Qualifier match winners will be declared based on the points accumulated in the rounds.

- In the event of a tie, a rematch lasting 5 minutes will be conducted to determine the ultimate winner.

- Teams are permitted a timeout of 2 minutes per round for repairing minor casualties.

- Points deductions commence if the timeout exceeds 2 minutes.

- In case of a situation arising during the match, if both teams agree, time will be paused, and the bots will return to the starting zone.

- If any managerial/technical issues occur, organizers reserve the right to delay the match.

Rules:-

Judging Criteria:

- Victory is awarded to a robot if its opponent is immobilized.

- A bot is considered immobilized if it cannot move linearly/rotationally for more than 30 seconds.

- A robot with one side of its drive train disabled is not declared immobilized if it can demonstrate controlled movement.

- If both robots remain mobile after the round, the winner will be determined subjectively.

- Points are assigned based on aggression, damage, control, and strategy.

- Pinning, holding an opponent stationary through force, is allowed for a maximum of 15 seconds per pin/lift, after which the attacker must release the opponent.

- Teams failing to stop pinning/lifting multiple times may face disqualification.

Machine Specification (15 kg):

- The robot's weight, including pneumatic/hydraulic components outside the arena, should not exceed 15 kg.

- Robots must be wireless.

- The robot should fit within a box of dimensions 750mm x 750mm x 1000mm.

- External devices for control are not included in size constraints.

- Zero ground clearance is permitted if it does not damage the arena.

Mobility (15 kg):

- Robots in the 15 kg category can exhibit the following modes of mobility:

  - Rolling (wheels or whole bot).

  - Linear actuated legs or cam operated motion or any non-wheeled drive system.

  - Jumping or flying with the help of propellers or gas balloons is not allowed.

Electrical System Specifications:

- The robot's electrical system must adhere to the following specifications:

  - The bot can be powered electrically (DC) by batteries with electrolytes such as Li-ion, Li-Po, NiCad, gel cells, lead-acid, etc.

  - The electric voltage between 2 points anywhere in the machine should not exceed 48 V DC at any point in time.

  - Batteries should be fully charged before advancing to the match.

  - All efforts must be made to safeguard battery terminals from a direct short, as causing a battery fire will result in direct disqualification.

  - Internal combustion engines as a source of power are strictly prohibited.

  - The use of any inflammable liquid in the bot is not allowed under any circumstances.

Pneumatics and Hydraulics:

- Non-inflammable liquid can be used for hydraulic devices.

- Maximum pressure in the storage/source tank must not exceed 8 bars.

- Provision for pressure checking with an integrated or temporarily fitted pressure gauge.

- Hydraulic liquids should be non-corrosive and leak-proof.

- Care must be taken to prevent direct fluid streams in case of damage.

Attacking/Weapon System:

- Robots in the 15 kg category are allowed to equip various weapons, including cutters, flippers, saws, lifting devices, spinning hammers, spinning drums, etc.

- Prohibited weapons or attacking systems include:

  - Liquid projectiles and tethered or untethered projectiles.

  - Any kind of inflammable liquid.

  - Any kind of explosive or intentionally ignited solid or potentially ignitable solid.

  - Nets, tape, glue, chains, or any other entanglement device.

  - High-power magnets or electromagnets.

  - Radio jamming, lasers, tesla coils, or any other high-voltage device.

- Spinning weapons are permitted as long as they do not make contact with the arena at any point in time.

- It is crucial to ensure that the robot's actions do not cause damage to the arena in any case

General Rules (15 kg):

1. Any damage inflicted on the arena at any point in time will result in immediate disqualification or penalties.

2. A team member is restricted from participating in more than one team.

3. It is mandatory to present your college/student ID card at the time of the competition.

4. Violation of any of the aforementioned rules will result in teams being barred from participating in the competition.

5. Decisions made by judges are deemed final and binding for all participants.

6. Misbehaviour during the competition will result in disqualification.