

GLADIATOR

This game involves two robots combating in an arena. A robot is declared as the winner if it can force or push any part of the opponent's body to touch the ground outside the arena.

1. OBJECTIVE

To design an autonomous robot equipped with devices and mechanisms to force or push its opponent out of the arena.

2. LEVELS OF THE COMPETITION

2.1 This event comprises four progressive levels of competition as shown below:

Preliminary Round : Round Robin [maximum of five teams to one sub-group]
Quarter-Final : Knock-out system [Draw lots for line-up]
Semi-final : Knock-out system
Final : Knock-out system [followed by Sudden Death if there is a draw]

2.2 During the preliminary rounds [round robin], entries are divided into several sub-groups, each with a maximum of five entries. And entries in each sub-group will compete among themselves. Each game between two robots consists of three matches. The best of three matches wins the game and points will be awarded based on the following:

Win : 1 point
Draw : 0 point
Lose : 0 point

The entry with the highest score from each sub-group will progress to the next level of competition.

2.3 Depending on the number qualified for the next level of competition, the judges reserve the rights to include a few entries from among the 2nd and 3rd placing, at appropriate level of competition to form the last eight entries for the quarterfinals and/or four entries for the semi-finals.

3 HOW THE GAME IS PLAYED

3.1 Every game comprises two robots fighting it out over three matches. Each match lasts 45 seconds. The task of each robot is to force or push its opponent out of the arena.

3.2 At the beginning of each match, the two competing robots are positioned behind the designated 'Start' point in their respective side of the arena. And a portion of the robot's body must be seen to be touching the centre line of the arena.

3.3 During the preliminary rounds (Section 3.2), robots assigned to each sub-group will compete against each other. In each game, the robot with the best of three matches wins and is awarded one point. After the rounds are completed, the robot scoring the highest points within each sub-group will progress to the next level of competition.

3.4 During the quarter and semi-finals, knock-out system is adopted. In each game, the robot with the best of three matches will progress to the next level of competition.

3.5 Tie Breaker

Whenever a tie occurs in the preliminary rounds [applies to selection of entries to next level of competition only], quarterfinals and semi-finals, it will be resolved through a tie-breaker system. This tie-breaker system uses a Dummy Robot [weighing between 5 kg to 10 kg] as a 'stand-in' opponent. This dummy robot will be positioned at the centre of the arena. Robots involved in the tie will compete individually against this dummy robot. A match time of 45 seconds is given to push the dummy robot out of the arena. The robot that can accomplish it in the shortest possible time wins. However, if both fail to push the dummy robot out of the arena when the 45-second match time is up, then both will not be eligible to proceed to the next level of competition.

3.6 One-minute Set-up Time

Robot handlers are given a 'one-minute set-up time' to prepare the robot before each match. If a robot is not ready after the one-minute is up, it would be deemed as a walk-over. The next match shall proceed immediately until all the three matches are played. A match can also commence early if both robots are ready before the one-minute set-up time is up.

When the match commences, each robot handler must activate his/her robot immediately. And the robot must move completely over the 'Start' line towards the opponent.

4. RULES AND REGULATIONS

4.1 A robot wins if it can force, wrestle or push the opponent until any part of the opponent's body makes contact with the ground outside the arena.

4.2 A robot is retired if :

- * it fails to perform after the one-minute set-up time is up.
- * any parts/mechanisms falling completely out of the body during the competition.
- * any devices/mechanisms and weapons/tools extended out during combat and are not retracted at the end of each match to a position confined within the robot's dimensional limits. This is inclusive of all conditions such as being trapped by or entangled with any part of the opponent, etc. [No non-retractable projectiles/missiles are permitted, e.g., shooting]
- * any linear or rotary cutting devices or tools e.g. chopper, rotating saw blades are used.
- * any parts, tools or mechanisms falling out of the robot during combat
- * any suction, anchoring or similarly devices are used to hold the robot firmly onto the ground.
- * any dangerous devices such as high emf/frequency emitter, corrosive liquid, explosives, etc. are used as weapons.

4.3 Inspection of Robots

One hour before the competition commences; all participants must submit their entries for inspection by a panel of judges. After which the entries will be caged and displayed for public viewing. During caging, modification of the robots is allowed in order for the robots to pass the caging requirements. However, the extent of the caging is up to the discretion of the Judges.

- 4.4 After an entry has been submitted for inspection, no alterations, changes and/or modifications to their mechanical design, power supply, and /or electronic circuitry are permitted before and during the competition without the permission of the judges. Failure to observe this ruling will subject the participant with disqualification. However, before each level of competition i.e. quarterfinals, semi-finals and final, commences robots are allowed to replace their battery.

5. SPECIFICATIONS

- 5.1 Robots failing to meet any of the following specifications during the cage-in will be disqualified.

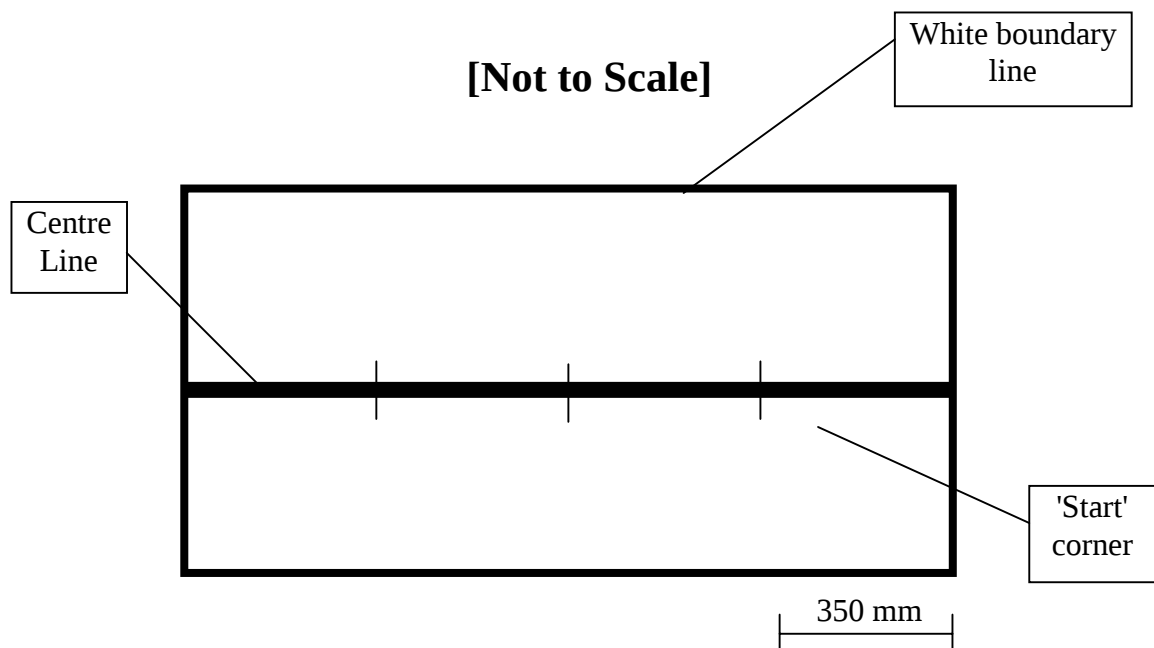
- * Weight of robot ≤ 10.0 kg
- * Physical dimensions : ≤ 300 mm [Length] x ≤ 300 mm [Width]
- * The height of the robot : >150 mm [Height]
- * Autonomous

5.2 Specifications of Dummy Robot

A plastic container with dimensions of ≤ 300 mm [diameter] x ≤ 300 mm [height] is used as a dummy robot. And a pack of rice weighing at least 5 kg will be placed inside the container. However, the overall weight of the dummy robot shall not exceed 10 kg.

6. ARENA

The 1 m (L) x 2 m (W) x 0.1m (H) arena is made of 10 mm to 20 mm thick wood [of table-tennis table quality and finishes]. A centre line is laid length-wise with 25-mm reflective tape. The arena [table] is elevated at least 100 mm above the ground level. The boundary of the arena is marked with a white line [approximately 25-mm wide]. The start lines and the arena centre are marked with [50 x 25] mm reflective tapes. All dimensions are subject to a $\pm 3\%$ general tolerance. All platforms used in the competition must be uniform in size and finishing.



7. CLONING

- 7.1 In accordance with the spirit of the competition, clones will only be awarded one prize even though they may produce the best results.
- 7.2 Clones will be identified during the 'caging' procedure. Once identified, they will be grouped together separately and compete among themselves before the preliminary round commences. Eventually, only one of the clones is permitted to enter the preliminary rounds.
- 7.3 Clones will be identified by substantially identical physical appearance and working principles.
- 7.4 When in doubt, the decision of the judges will be final.