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 or when the judges declare its opponent as disabled/immobilised.

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 : 3 point
Draw : 1 point
Lose : 0 point

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

2.3 The number of qualified entries for the next level of competition is subjected to the outcome of the competition at any level. The judges reserve the rights to choose a few entries from among the second and third ranking at any level of the 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 inside the starting box in their own side of the arena.

3.3 During the preliminary rounds (Section 2.1), robots assigned to each group will compete against each other. In each game, the robot with the best of three matches wins and is awarded 3 points. If both robots draw, each robot is awarded 1 point. After all the rounds are completed, the robot scoring the highest points within the 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. The 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 accomplishes 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 when the one-minute is over, it shall be deemed as a walkover for its opponent. 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 over.

Before a match commences, the robot must restore to the original size and shape that includes any mechanisms that extended out during the previous match and this has done within the one-minute set-up time.

When a match commences, the robot handler must activate his/her robot immediately.

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 over.
* any parts/mechanisms falling completely out of the body during the competition.
* any suction, anchoring or similarly devices are used to hold the robot firmly onto the ground.
* internal combustion engines are used.
* any linear or rotary cutting devices or tools e.g. chopper, rotating saw blades are used.
* Shooting weapons are used, e.g. projectiles/missiles, no matter if the projectiles can be retracted.
* any dangerous devices such as high emf/frequency emitter, corrosive liquid, explosives, etc. are used as weapons.
* During combat, the robot size is larger than half of the arena (1m X 1m) including any extended weapons or mechanisms.

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 1m (L) x 2m (W) x 0.1m (H) arena is made of 10mm to 20mm thick wood [table-tennis table quality finishing]. A Centre Line marked by blue paint [Fox-Blue: Nippon Sprayed Paint 307] of 10mm width. The arena is elevated at least 100mm above the ground level. The boundary of the arena is marked with a white reflective tape [approximately 25mm width]. The start boxes are of size 0.35m (L) x 0.5m (W). They are marked by blue paint [Fox-Blue: Nippon Sprayed Paint 307] of 10mm width. All dimensions are subject to +/- 3% tolerance. All platforms used in the competition must be uniform in size and finishing.
7. CLONING

7.1 Clones shall be identified during the entry caging. 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.

7.2 Clones shall be identified either by substantially identical physical appearance and/or performance. Clones only apply to entries from the same institution/individual.

7.3 In the event of any ambiguity in the competition rules, the judge’s interpretation shall prevail. Should a situation arise that is not addressed in the rules, the judges will decide on the matter, and their decision will be final.