ROBOT BATTLEFIELD

1. OBJECTIVE

Design a mobile robot that can navigate through a mine-field and reach the predetermined destination in the shortest possible time

2. HOW THE GAME IS RUN ?

2.1 A maximum Competition Time of 3 minutes is allocated to each round.

2.2 Each robot will commence from its respective mid-span "START" position and try to cross the predetermined destination [i.e. 'Finishing Line'] on the opposite side of the arena in the shortest possible run time. In doing so, it has to navigate through a maze of mines and obstacles while observing the rules and regulations.

To make the game more interesting, the Finishing Line is confined to a 1.5-metre wide goal-post marked with two tennis balls.

2.3 The first robot, together with all parts of its body, that *crosses the Finishing Line* will emerge as the winner of that round. In the process, the goal-post markers [tennis balls] must not be moved or disturbed.

All robots must stop once a winner for that round is determined or when the Competition Time of 3 minutes is up; whichever is earlier.

For the Final Round, after the winner has emerged; the game can continue for other entries to vie for the remaining top positions i.e. first and second runner-up.

2.4 A robot is not allowed to continue with the race if it violates any one of the following conditions:

i) ventures completely beyond the arena boundary,

ii) triggers a mine,

iii) hits any goal-post markers i.e. moves the tennis ball,

iv) stalls in the arena for more than 30 seconds,

v) manual assistance or intervention is needed for whatsoever reasons.

Obstacles are considered as part of the maze. As such, no penalty will be imposed if they are moved or disturbed by a robot.

2.5 In each round, a maximum of four competing robots may enter the arena. Once inside the arena, a robot is permitted to push other opponent robots either out of the arena or towards a mine and/or obstacles. If a robot violates any of the conditions mentioned in 2.3 above, it will not be allowed to continue with the race.

3. ENTRY TO HIGHER COMPETITION LEVEL

3.1 There will be a maximum of 32 entries in the Qualifying rounds; eight in the Semi-final rounds and four in the Final Round.

3.2 During the Qualifying and Semi-final rounds, if no robot manages to complete a successful run; then no representation from that group is allowed to advance to the next level of competition.

3.3 In the Final round, entries will vie for the position either as Champion; 1st runner-up and 2nd runner-up. If no robot manages to complete a successful run after the Competition Time has elapsed; a short break of 3 minutes is permitted before a re-match is resumed.

3.4 During the re-match, if no outright winner emerges again, then all the finalists will retire and each will be awarded a consolation prize.

4. RULES & REGULATIONS

4.1 Entries

Line-up of Robot for competition:		By drawing lots
Targeted Destination of Robot	:	'Goal post' located on opposite side of arena
Max. Competition Time/round	:	3 minutes

4.2 Inspection of Robot

30 minutes before the competition commences, all participants must submit their entries for inspection by a panel of judges. After which all robots must be displayed on a designated table for public viewing.

4.3 Disqualification

- 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/or during the competition without any permission from the judges. Failure to observe this ruling will subject the participant with disqualification.
- No participant is permitted to step inside the arena other than to retrieve robots that has stalled or when human intervention is required.

5. SPECIFICATIONS

5.1 Specifications of Robot

i) Min. Dimensions: 300mm[Length] x 300mm[Width] x Height [No restriction]

ii) Weight: Not more than 10 kg.

iii) Power supply: Autonomous.

iv) No retro-reflective tape or coating on the robot body.

5.2 Specifications of Competition Arena [Figure 1]

* Area: 5 m x 5 m [Lined with non-reflective black tapes (~ 50 mm width)]
* Floor & Light: Lighting & floor as per condition of designated Competition Hall.
* 'START': The mid-span marking on each side of arena
* Nos of Mines: Minimum 12 mines per round
* Finishing Line: 'Goal-post' marked with two tennis balls 1.50 metres apart
* Obstacles: 5 circular BLACK plastic containers [min. ϕ 0.5m X min. height 0.2m] randomly positioned. 4 wooden blocks of approx.1000 mm x 50 mm x 50 mm are placed diagonally at all four corners as shown in Figure 1.

* Entries per round: Maximum 4 entries
* Distance between mines/obstacles: minimum 400 mm

5.3 Specifications of Mines (Figure 2)

Dimension:	Approx. ϕ 300 mm x 200 mm [height excludes light indicator]
Metallic Casing:	Coated in black. Base affixed with 25 mm Scotch-lite Reflective Tape.
Accessories:	Built-in Lamp & Alarm system powered by battery
Activation:	When mine is disturbed, the lamp & alarm system will activate.

5.4 General Tolerances

General tolerance of $\pm$ 2 % is permitted for all dimensions unless otherwise specified.

6. CLONING

6.1 In accordance with the spirit of the competition, clones among the winning entries will only be awarded one prize. Clones will be identified during the "caging" procedure.

6.2 Clones are robots with substantially identical physical appearance and working principles.

6.3 When in doubt, the decision of the Judges will be final.

Figure 1: Competition Arena

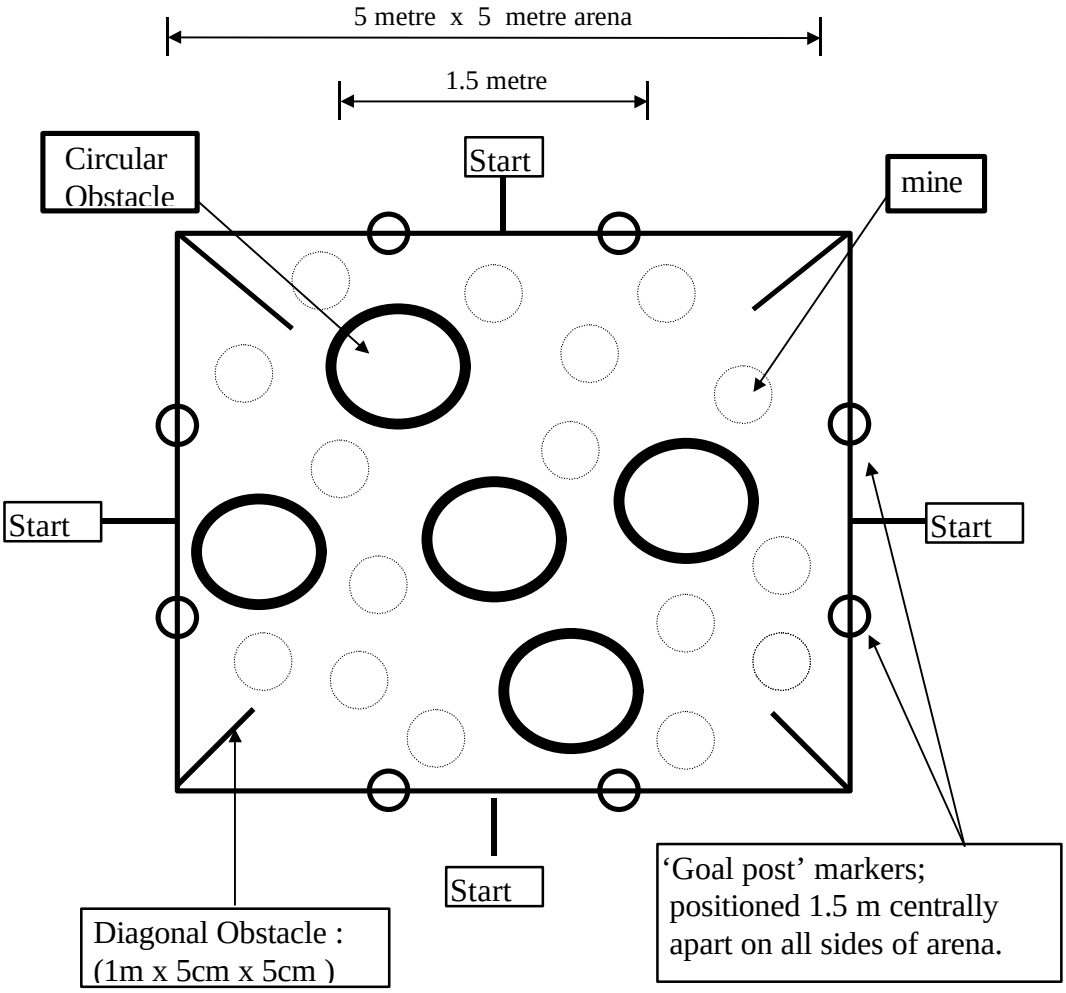

Figure 2 : Dimensional Details of Mine