Robowarz

**Task:**

Teams have to build Design and construct a remote controlled robot capable of fighting a one on one tournament.

**Rounds:**

The competition will be the knock out round. There will be 2 teams fighting against each other to will the title of winner.

**Specification:**

* **Dimension and Fabrication:**

1. The machine should fit in a box of dimension 750mm x 750mm x 1000 mm (l x b x h) at any given point during the match. The external device used to control the machine or any external tank is not included in the size constraint.
2. The machine should not exceed 60 kg of weight including the weight of pneumatic source/tank. All pneumatic tanks/source and batteries should be onboard. Weight of remote controller will not be counted.

* **Mobility:**

All robots must have easily visible and controlled mobility in order to compete. Methods of mobility include:

1. Rolling (wheels, tracks or the whole robot).
2. Non-wheeled robots having no rolling elements in contact with the floor and no continuous rolling or cam operated motion in contact with the floor, either directly or via a linkage. Motion is "continuous" if continuous operation of the drive motor(s) produces continuous motion of the robot. Linear-actuated legs and novel non-wheeled drive systems come under this category.
3. Jumping and hopping is not allowed.
4. Flying (using airfoil, helium balloons, ornithopters, etc.) is not allowed.

* **Robot Control Requirements:**

1. The machine can be controlled through wireless remote or the wired remote only. Power supply should be on board only. Refer below for further details on battery and power.
2. There should be binding capability between transmitters and receivers. The remotes with such facility will only be allowed.
3. The team must have at least four frequency wireless remote control circuit or two dual control circuits which may be interchanged before the start of the race to avoid frequency interference with other teams. The case of any interference in the wireless systems will not be considered for rematch or results.
4. Remote control systems from toys might be used. Remote control systems available in the market may also be used.
5. Nonstandard or self-made remote control systems must first be approved by the organizers.
6. Team should pair up the wireless remote with the machine before putting it into the arena.

* **Battery and Power:**

1. The machine can be powered electrically only. Use of an IC engine in any form is not allowed. On board batteries must be sealed, immobilized-electrolyte types (such as gel cells, lithium, NiCad, NiMH, or dry cells).
2. The electric voltage between 2 points anywhere in the machine should not be more than 36V DC at any point of time.
3. All efforts must be made to protect battery terminals from a direct short and causing a battery fire, failure to do so will cause direct disqualification.
4. Use of damaged, non-leak proof batteries may lead to disqualification.
5. Special care should be taken to protect the on-board batteries. If judges found that the battery is not properly protected, then team will be disqualified immediately.
6. Change of battery will not be allowed during the match.
7. Only bots with onboard batteries are allowed.

It is suggested to have extra battery ready and charged up during competition so that on advancing to next level, you don’t have to wait or suffer due to uncharged battery. If teams don’t show up on allotted slot, they will be disqualified.

* **Pneumatics**

1. Robot can use pressurized non-inflammable gases to actuate pneumatic devices. Maximum allowed outlet nozzle pressure is 15 bar. The storage tank and pressure regulators used by teams need to be certified and teams using pneumatics are required to produce the Safety and Security letters at the Registration Desk at the venue. Failing to do so will lead to direct disqualification.
2. Participants must be able to indicate the used pressure with integrated or temporarily fitted pressure gauge. Also there should be provision to check the cylinder pressure on the bot.
3. The maximum pressure in cylinder should not exceed the rated pressure at any point of time.
4. You must have a safe way of refilling the system and determining the on board pressure.
5. All pneumatic components on board a robot must be securely mounted. Care must be taken while mounting the pressure vessel and armor to ensure that if ruptured it will not escape the robot. The terms 'pressure vessel, bottle, and source tank' are used interchangeably.
6. Entire pneumatic setup should be onboard, no external input (from outside the arena) can be given to the robot for functioning of its pneumatic system.

* **Hydraulics:**

1. Robot can use non-inflammable liquid to actuate hydraulic devices e.g. cylinders.
2. All hydraulic components on-board must be securely mounted. Special care must be taken while mounting pump, accumulator and armor to ensure that if ruptured direct fluid streams will not escape the robot.
3. All hydraulic liquids are required to be non-corrosive and your device should be leak proof.
4. Maximum allowed pressure is 15 bars.
5. Participant must be able to indicate the used pressure with integrated or temporarily fitted pressure gauge.
6. Entire hydraulic setup should be onboard, no external input (from outside the arena) can be given to the robot for functioning of its hydraulic system.

* **Weapons System:**

Robots can have any kind of magnetic weapons, cutters, flippers, saws, lifting devices, spinning hammers etc. as weapons with following exceptions and limitations:

1. Liquid projectiles.

2. Any kind of inflammable liquid.

3. Flame-based weapons.

**Game Rules:**

**Abstract Submission:**

The written abstract should be prepared on the following lines:

1. The weapon systems and power supply method should be explained in detail, along with proper diagrams. Picture(s) showing these should be attached.
2. Functioning of wireless remote and the frequency or any other wireless module used for wireless remote must be explained in detail.
3. Description of any unusual advantageous mechanism used. The specifications of all the components used, including motors, suspension springs, remote controller, wires, battery etc. have to be mentioned.
4. You can email the portfolio minus the video and send the video later. This will make sure that at least the abstract part of your portfolio reaches us before the deadline.
5. An email will be sent to the team leader confirming the receipt of the entry. Each team is allowed to make online submission only by email. In case of multiple submissions, only the first submission will be used for judging purposes.
6. All submission must be made online before the deadline.
7. Soft copy of the permission regarding pneumatics and hydraulics capacity must be mailed to before deadline. Hard Copy of the permission must be brought during the competition. Teams failing to do so, will not be allowed to participate.

**Criteria of winning:**

1. A robot is declared victorious if its opponent is immobilized.
2. A robot will be declared immobile if it cannot display linear motion of at least one inch in a timed period of 30 seconds. A bot with one side of its drivetrain disabled will not be counted out if it can demonstrate some degree of controlled movement. In case both the robots remain mobile after the end of the round then the winner will be decided subjectively.
3. A robot that is deemed unsafe by the judges after the match has begun will be disqualified and therefore declared the loser. The match will be immediately halted and the opponent will be awarded a win.
4. If a robot is thrown out of the arena the match will stop immediately, and the robot still inside the arena will automatically be declared as the winner.
5. Robots cannot win by pinning or lifting their opponents. Organizers will allow pinning or lifting for a maximum of 20 seconds per pin/lift then the attacker robot will be instructed to release the opponent. If, after being instructed to do so, the attacker is able to release but does not, their robot may be disqualified. If two or more robots become entangled or a crushing or gripping weapon is employed and becomes trapped within another robot, then the competitors should make the timekeeper aware, the fight should be stopped and the robots separated by the safest means.
6. Points will be given on the basis of aggression, damage, control and strategy.
7. Aggression – Aggression is judged by the frequency, severity, boldness and effectiveness of attacks deliberately initiated by the robot against its opponent. If a robot appears to have accidentally attacked an opponent, that act will not be considered Aggression.
8. Control – Control means a robot is able to attack an opponent at its weakest point, use it's weapons in the most effective way, and minimize the damage caused by the opponent or its weapons.
9. Damage – Through deliberate action, a robot either directly or indirectly reduces the functionality, effectiveness or defensibility of an opponent. Damage is not considered relevant if a robot inadvertently harms itself. Also, if a pressure vessel or a rapidly spinning device on a robot fragments, any damage to the opponent will not be considered "deliberate".

**General Rules:**

1. Only 1 member of the team is allowed to handle the bot.
2. Participants are not allowed to keep anything inside the arena other than the bot.
3. Laptops/personal computers are not allowed near the arena. Other Wi-Fi, Bluetooth, etc. devices must be switched off. The organizers hold the right to check for these devices and their usage and disqualify the team.
4. The time measured by the organizers will be final and will be used for scoring the teams.
5. Time measured by any contestant by any other means is not acceptable for scoring.
6. In case of any disputes / discrepancies, the organizers’ decision will be final and binding.
7. The organizers reserve the rights to change any or all of the above rules as they deem fit. Change in rules, if any will be highlighted on the website and notified to the registered teams.
8. Only one team is allowed to be present during the run, other teams will have to stay outside the hall.

**Event Terminologies:**

1. Disabled – A robot is not functioning correctly due to either an internal malfunction, or contact with the opposing robot or Arena Hazard.
2. Disqualification – A Robot is no longer permitted to compete in the current Robowars Tournament.
3. Immobilized – In Judge's opinion, a robot is not responsive for a specified period of time.
4. Knockout – Occurs when the attack or deliberate actions of one robot causes its opponent to become immobilized.
5. Lifting – Occurs when one robot controls an opponent's translational motion by lifting the drive mechanism of the opponent off of the Arena floor.
6. No Contact – Occurs when neither robot makes contact with each other for a specified period of time.
7. Pinning – Occurs when one robot, through sheer force, holds an opponent stationary in order to immobilize it.
8. Radio Interference – Refers to the situation where at least one robot becomes non Responsive or non-controllable due to the effect of the other robot's remote-control signal.
9. Non-Responsive – In a Referee's opinion, the robot cannot display some kind of controlled translational movement along the Arena floor.
10. Restart – Occurs after a Fault or a Timeout has been declared and the competing robots are ready to continue.
11. Stuck – A robot is hung-up on a part of the Arena, an Arena Hazard or an opponent, such that it is effectively non-responsive.
12. Tap-Out – Occurs when a Robot's Operators decide that they no longer want to continue the Match, and concede the win to the opposing Team.
13. Technical Knockout – Occurs when a robot wins due to immobilization of its opponent even though, in the Judges' opinion, no action of the winning robot caused the opponent's immobilization.
14. Timeout – A temporary halting of a Match. Timeouts are usually called to separate robots, but can be called for other reasons as well

**Team Specification:**

Any team can participate in Robowars. A team may consist of a maximum of 6 participants. These participants can be from same or different institutes.

Team Name: Every team must have a name which must be unique. Fest organizers reserve the right to reject entries from any Team whose name it deems inappropriate, offensive or conflicting. Organizers must be notified during if a Team's name has been changed.

Team Representative: Each team must specify their Team Representative (Leader) at the time of registration on the website. All-important communications between the fest and the registered teams will be done through their Team Representative. The Team Representatives must submit valid contact details (phone no., email ID etc.) at the time of registration.

**Eligibility:**

All students with a valid identity card of their respective educational institutes are eligible to participate.