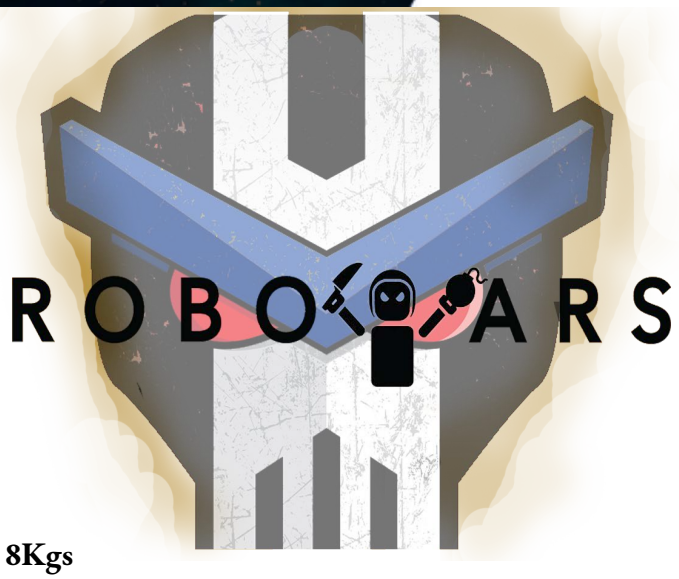

Weight Category - 8Kgs

Contents-

1. ABOUT

With current in the veins and blood in wires, be ready to witness sparks fly, as metal crushes metal in the most glorious of battles. Brace yourselves to be part of one of the most exciting tournaments, "ROBOWAR", held under the Robotron Module of Tecnoesis.
IT'S BIGGER, BETTER AND IT'S BACK.
LET THE WAR BEGIN.

2. TASK

Design and construct a remote-controlled robot capable of fighting a tournament against another robot(s).

3. DESIGN SPECIFICATIONS

A. Specifications:

1. There will be no restrictions on the dimensions of the bot.
2. The weight of the machine should not exceed **8 Kgs (17.64 Lbs)**. The weight of the remote controller will not be counted.
3. A bot can be in a "Cluster Bot" formation. Each bot must meet the requirements described in this problem statement. The total weight of all the bots and the dimensions of the combination of bots must satisfy the above two points.

B. 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: non-wheeled robots have 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, but are not true walkers as defined below. 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 are also allowed under this category.
3. Manually operated jumping and hopping are allowed. However, the maximum height of any part of the machine should not exceed 3ft during any stage of its jumping/hopping and any damage caused due to this mechanism is solely the responsibility of the team.

Mobility methods that are NOT allowed:

1. Flying (using airfoil, helium balloons, ornithopters etc.) is not allowed.
2. The robots should not secure itself on the ring surface by using suction cups, diaphragms, sticky treads, glue or other such devices.

C. Robot Control Requirements:

1. The robot can be controlled through both wireless, as well as wired remote. (teams must strictly keep the length of their wire more than 3.5 metres)
2. Control must be exhibited over all of its functions and positions. Although autonomous functions within the bot are acceptable, the controller must be able to remotely disable or override these functions at any time. Note that any damage due to this function is the responsibility of the team, and there must compulsorily be a manual emergency stop (E-stop) function that can be controlled from the radio controller to manually override this autonomous function in case of emergency.
3. In case of wireless remotes, there should be binding capability between transmitters and receivers and they must be able to connect between metal bars and barriers. Only the remotes with such facility will be allowed.
4. In case of wireless remotes, teams must have an at least four-frequency wireless remote-control circuit or two dual control circuits which may be interchanged before the start of the match to avoid frequency interference with other teams. Cases of any interference in the wireless systems will not be considered for rematch or results.
5. Remote control systems from toys may be used. Remote control systems available in the market may also be used, while nonstandard or self-made remote-control systems can be used only after approval from the organizers.
6. The team should pair up the wireless remote with the machine before putting it into the arena. No extra time will be provided for this once the machines are put inside the arena, and not connecting the remote with the machine prior to that may attract a penalty on the team.

D. Battery and Power:

1. The machine must be powered electrically. Use of an IC engine in any form is not allowed. Onboard batteries must be sealed, immobilized-electrolyte types (such as gel cells, lithium, NiCad, NiMH, or dry cells).
2. The electric voltage between any 2 points on the machine should not exceed 36V DC at any point in time. Participants will have to bring their own converters for standard power supply according to Indian standards.
3. Participants must protect the 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 onboard batteries. If the judges find that the battery is insufficiently protected, the team will be disqualified immediately.
6. Change of battery will not be allowed during the match.
7. Participants can power their robot with onboard as well as offboard power source, but within the mentioned voltage constrains.

The teams are suggested to have at least one extra battery ready and charged up during competition so that on advancing to the next level, they won't have to wait or suffer due to the uncharged battery (Refer section "Match Frequency"). ***If teams do not show up during their allotted slot, they will be disqualified.***

E. Weapon Systems:

1. Robots can have any kind of magnetic weapons, cutters, flippers, saws, lifting devices, spinning hammers etc. (if they qualify the criteria mentioned below) as weapons.
2. Following weapons cannot be used:
    a. Liquid projectiles (Foam, liquefied gases)
    b. Any kinds of inflammable liquids
    c. Weapons causing invisible damage (Electrical weapons, RF jamming weapons and others).
3. Sumo type bot,s without active weapons, are also allowed.

NOTE: A particular team may register with two bots only if both the bots display complete different weapon or defence mechanism.

4. COMPETITION RULES AND SPECIFICATIONS

A. Team Specifications:

1. Any team can participate in RoboWars, Tecnoesis. A team may consist of a maximum of 5 participants. These participants can be from the same or different institutes.
2. *Team Name*: Every team must have a unique name. Organizers reserve the right to reject entries from any team whose name it deems inappropriate, offensive or conflicting. Organizers must be notified if a team's name has been changed.
3. *Team Representative*: Each team must specify their team representative (leader) at the time of registration. All the important communication between Organizers and the registered teams will be done through their team representative. The team representative must submit valid contact details (phone no., email ID etc.) at the time of registration.

B. Match Duration and Type:

Matches will consist of 3 minutes of active fight time exclusive of any time-outs. Hence, it is not binding but advisable to keep battery capacity, power usage and machine defences such that they can sustain a 3- minute fight.

The matches can be of the following types:

1. *Match:* A regular 1-on-1 combat between 2 robots
2. *Rumble**(for losers' bracket):*** A combat between more than 2 robots simultaneously

A detailed document of rules regarding the format and rules to be followed during the event days shall be uploaded later, and the participants will be informed.

C. Match Frequency:

A team is allowed to prepare for the next match for a period of 30 minutes. This time is calculated from the time the robot leaves the post-match staging area of its previous match. If the team fails to return with the robot ready to the pre-match staging area when called after the allotted time, the team may be forced to forfeit. It is recommended that any routine maintenance (i.e. battery charging) should be capable of being performed well within this time period, or backup should be kept. In extreme cases, the 30-minute time period may be lengthened at the discretion of the event organizers.

D. Criteria for victory:

1. A robot is declared victorious if its opponent is immobilized.
2. A robot will be declared immobile if it cannot display the linear motion of at least one inch in a time period of 7 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, the winner will be decided subjectively.
3. If a robot is thrown out of the arena the match will be stopped immediately, and the robot inside the arena will automatically be declared as the winner.

5. Points will be given on the basis of aggression, damage and control.
    a. Aggression: Aggression is judged by the frequency, severity, boldness and effectiveness of attacks deliberately initiated by the robot against its opponent. aggression. Other than effective use of weapon, aggression also includes flipping and ramming the opponent's robot. If a robot appears to have accidentally attacked an opponent, that act will not be considered when judging for aggression.
    b. Control: Control is judged in terms of the ability to attack an opponent at its weakest point, using weapons in the most effective way, and minimizing the damage caused by the opponent.
    c. 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.

NOTE: A robot winning in a round against its opponent doesn't guarantee its entrance into the next round. If the judges found the winner robot incompetent to enter into the next round, it may get disqualified. Judges can disqualify both the robots of a match from advancing to the next round. All the decisions taken by the judge will be final and binding to all. Any queries afterwards will not be entertained.

E. Event Specific Terminology:

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 the judges' 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: Neither robot makes contact with the 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 a situation where at least one robot becomes unresponsive or non-controllable due to the effect of the other robot's remote-control signal.
9. Non-Responsive: In the judges' 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 in 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.

F. Safety Rules:

Compliance with all event rules is mandatory. It is expected that competitors stay within the rules and procedures of their own accord and do not require constant policing.

1. Special care should be taken to protect the onboard batteries and pneumatics, bot without proper protection will not be allowed to compete.
2. If you have a robot or weapon design that does not fit in this ruleset (even having some elements that are not mentioned as allowed/disallowed in this ruleset) or is somehow ambiguous, please contact Tecnoesis, NIT Silchar, at the earliest. Safe innovation is always encouraged, but surprising the organizers with your brilliant exploitation of a loophole may cause your robot to be disqualified before it even competes.
3. Each event has safety inspections. Your team will be allowed to compete at the sole discretion of authorities, to whom as a builder you are obligated to disclose all operating principles and potential dangers to the inspection staff.
4. Proper activation and deactivation of robots are critical. Robots must only be activated in the arena, testing areas, or with the expressed consent of the event coordinators.
5. All weapons must have a safety cover on any sharp edges.
6. All participants build and operate robots at their own risk. Combat robotics is inherently dangerous. There is no amount of regulation that can encompass all the dangers involved. Please take care to not hurt yourself or others when building, testing and competing. Any kind of activity (repairing, battery handling etc.) which may cause damage to the surroundings during the stay of the teams in the competition area should

not be carried out without the consent of the organizers. Not following this rule may result in disqualification.

7. All the resources provided at the time of competition from the organizers should be strictly used only after the consent of the organizers.
8. Once the robots have entered into the arena, no team member can enter into the arena at any point of time. In case if a fight has to be halted in between and some changes have to be done in the arena or condition on the robot(s), it will be done by organizers only.

5. ARENA SPECIFICATIONS

Arena Diagram:

The out-to-out dimension of the arena will be **8ft x 8ft (l x b**.

*These figures/parameters are subject to change. The arena size is also subject to the infrastructure. They will be conveyed through updates to this document, as per the "Important Note" below

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6. AN IMPORTANT NOTE:

These rules may change at any time, even without explicit notification to teams. However, the document uploaded here is to be followed as the latest problem statement for all the rules and design specifications. Any change can be observed in the name of the document which will contain a higher version (v2.0, say) if updated. The teams acknowledge that they have a responsibility to read, understand and abide by the rules and Tecnoesis, NIT Silchar, reserves the right to prevent any team from competing at any time for any reason (including but not limited to the reasons specified elsewhere in this document). However, we shall inform all registrants in case an updated version comes up (all the registrant till the date of revision). In case of any queries, participants are encouraged to contact Tecnoesis, NIT Silchar.

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