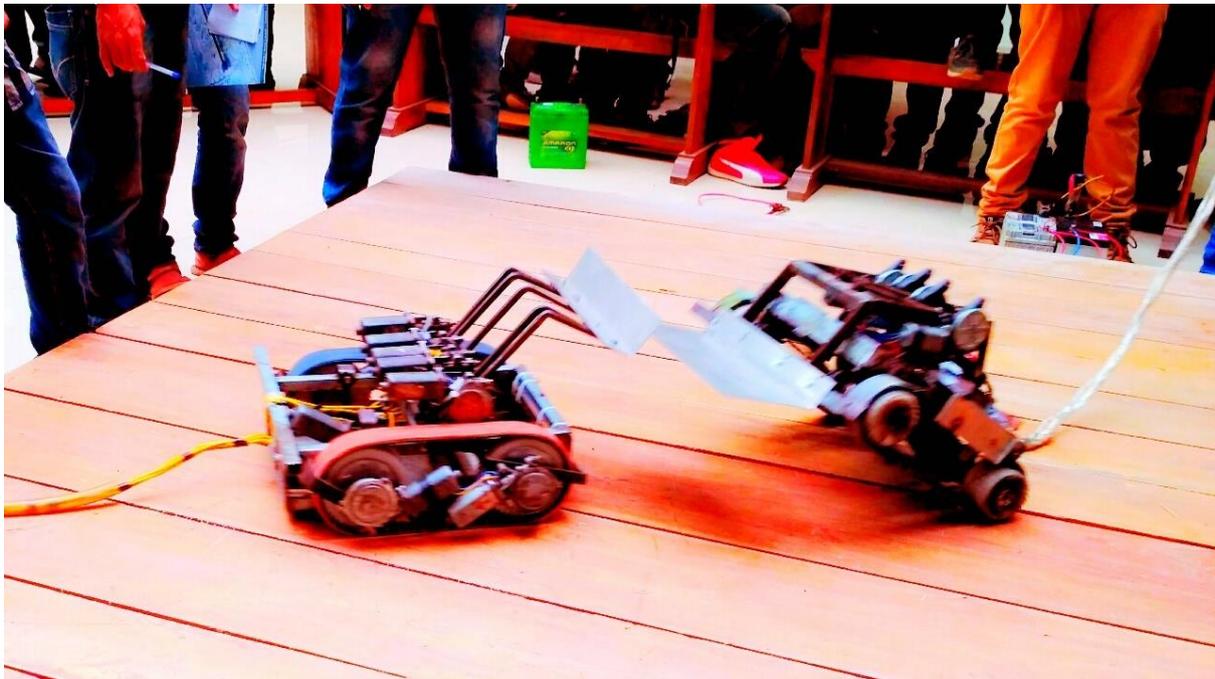


**IGNUS**  
19

# RoboWar



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## 1. Problem Statement

Build a manual or RC robot that will immobilize the opponent's robot to claim the crown of "Rampage".

## 2. Event Structure

The competition will be conducted via elimination round wherein any two opponents will be selected through random selection.

## 3. Team Size

Maximum 6 participants are allowed in a team. Students from different colleges can form a team.

## 4. Eligibility

Any student from a recognized institute/college can participate in this event.

## 5. Rules

- There will be qualifying rounds of 3 minutes and further rounds are of 4 minutes.
- If a robot, say R1, is able to drag the opponent's robot, say R2, to death zone twice during the fight, the respective team will be declared as WINNER.

- The Bot which got dragged to the death zone must be dragged to its full length.
- If any one of the two robots got dragged to the death zone, then both robots should reach their respective start zone immediately. Match and running time will continue after they reach their respective start zone.
- If any of the bots is unable to reach to respective start zone due to any type of failure within 1 minute, it may lead to disqualification.  
**Note: In any other case, Coordinator decision will be final and binding to all.**

## 6. Winning Criteria

- A robot is declared victorious if its opponent is immobilized.
- A robot will be declared immobile if it cannot display satisfactory motion of at least one foot in a timed period of 30 seconds.
- In case both the robots remain mobile after the end of the round then the winner will be decided subjectively.
- 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.
- 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.
- 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 robots will be instructed by the organizers to release. If, after being instructed to do so, the attacker wants 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.

**NOTE: Qualification of a robot to next level be subjective and totally on the decision of the judges. 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.**

## **7. Dimension and fabrication**

- The machine should fit in a box of dimension 75 cm x 75 cm x 100 cm (lxbxh) at the start of during the match. The external device used to control the machine or any external tank is not included in the size constraint.
- The machine weight should not exceed 60 kg **strictly**.
- Any part of the robot which is outside arena (whether it is battery or external tanks) except remote control and wires are included in weight (1.5 Times of actual).

## **8. Mobility**

- All robots must have easily visible and controlled mobility in order to compete. Methods of mobility include:
  - Rolling (wheels, tracks or the whole robot).
  - Jumping and hopping are not allowed.
  - Flying (using airfoil, helium balloons, etc.) is not allowed.

## 9. Robot Control Requirements

- The machine can be controlled through the wired or wireless remote.
- The machines using wireless remote must at least have a four frequency 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.
- Remote control systems from toys might be used. Remote control systems available in the market may also be used.
- Non-standard or self-made remote control systems must first be approved by the organizers.
- In the case of wired robots, the minimum length of wires from robot to the controller should be 6 meters, and the wire should remain slack at any instant during the fight. All the wires coming out of the robot should be stacked as a single unit.
- Also, the wires should be projected 1 meter above the ground to avoid entanglement.

## 10. Battery and Power

- 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).
- The electric voltage between 2 points anywhere in the machine should not be more than 36V DC at any point in time.
- 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.
- Use of damaged, leaky batteries may lead to disqualification.
- Special care should be taken to protect the on-board batteries.
- Change of battery will not be allowed during the match.

- The power source will not be provided by organizers. Teams are responsible for the power source. However, an AC 230V source can be provided for recharging the batteries after a match.

## 11. Pneumatics

- The robot can use pressurized non-inflammable gasses to actuate pneumatic devices. Maximum allowed outlet nozzle pressure is 8 bars. The storage tank and pressure regulators used by teams need to be certified. Failing to do so may lead to direct disqualification.
- 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 robot.
- The maximum pressure in cylinder should not exceed the rated pressure at any point in time.
- You must have a safe way of refilling the system and determining the on-board pressure (if the system is on-board).
- 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.

## 12. Hydraulics

- The robot can use non-inflammable liquid to actuate hydraulic devices e.g. cylinders.
- All hydraulic components on-board a robot 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.

- All hydraulic liquids are required to be non-corrosive and your device should be leak proof.  
Maximum allowed pressure is 8 bars.
- Participant must be able to indicate the used pressure with integrated or temporarily fitted pressure gauge.

## 13. Weapon Systems

- Robots can have any kind of magnetic weapons, cutters, flippers, saws, lifting devices, spinning, hammers etc. as weapons with following exceptions and limitations:
- Liquid projectiles.
- Any kind of inflammable liquid.
- Flame-based weapons.
- Any kind of explosive or intentionally ignited solid or potentially ignitable solid.
- High power magnets or electromagnets.
- Radio jamming, Tasers, Tesla coils, or any other high-voltage device.
- Tethered or untethered projectiles.
- Spinning weapons which do not come in contact with the arena at any point of time are allowed. In no case should the arena be damaged by any bot. The competition will be played on a knock-out basis. There can be some hazards in the arena (subject to change, will be notified as soon as decided).

## 14. Safety Rules

- Once the robots have entered the arena, no team members can enter the arena at any point in time. In case if the fight has to be halted in between and some changes have to be done in the arena or condition of the robot(s), it will be done by organizers only. Special care should be taken to protect the on-board batteries and pneumatics (If any), a robot without proper protection will not be allowed to compete.

- If you have a robot or weapon design that does not fit within the categories set forth in these rules or is in some way ambiguous or borderline, please contact the event organizers.
- Each event has safety inspections. It is at their sole discretion that your robot is allowed to compete. As a builder, you are obligated to disclose all operating principles and potential dangers to the inspection staff.
- Proper activation and deactivation of robots are critical. Robots must only be activated in the arena, testing areas, or with expressed consent of the event coordinators.
- All weapons must have a safety cover on any sharp edges.
- 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, pneumatics systems 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 organizers. Not following this rule may result in disqualification.
- All the resources provided at the time of competition from the organizers should be strictly used only after the consent of the organizers.
- Once the robots have entered the arena, no team members can enter the arena at any point in time. In case if the fight has to be halted in between and some changes have to be done in the arena or condition of the robot(s), it will be done by organizers only.

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