RoboWars

General Rules

1. The competition will be played on a knock-out basis.
2. The bot will be inspected for safety before the event begins. If found to be unsafe for the participants/spectators, it will be discarded.
3. The organizers reserve the right to change any or all of the rules as they deem fit. Changes in rules, if any, will be highlighted on the website.
4. Violation of any of the rules will result in immediate disqualification.
5. The maximum time limit for the clash of combatants inside the arena is 10 minutess.
6. A bot will be declared immobile (out) if it cannot exhibit linear motion of at least one inch within 30 seconds. A bot with one side of its drive train disabled will not be counted out if it can demonstrate some degree of controlled movement.
7. Teams that are not ready when called for battle will be considered to have declared a walkover, and will receive no points.
8. The bot cannot be split into two sub-units. Two distinct parts connected by a flexible cable will be considered separate units.
9. Damaging the arena will lead to immediate disqualification.
10. Lego kits, readymade kits, car bases and development boards are not permitted. Readymade gear boxes are permitted.
11. In all cases, the judges' decision will be final and binding.

Video & Abstract Submission

Participants have to submit a portfolio of their robot, consisting of a written abstract of the working model and a video of the same before the competition. In the abstract, teams must mandatorily mention the range of frequencies they are going to use to control their robot, if it is radio-controlled. Teams have to specify whether the bot is having any autonomous parts; if it does, then the functionality of the part has to be described as well. The weapons systems and power supply systems should also be explained in as much detail as possible, along with proper diagrams. Picture(s) showing these should be attached to the document. Description of any unusual advantageous mechanism used must also be detailed. The specifications of all the components used, including motors, suspension springs, remote controllers, wires, batteries, etc. have to be mentioned. The abstract can be sent as a PDF file; alternately, the abstract can be submitted on paper.

Portfolio should be E-mailed

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1. If you are unable to send your entire portfolio within the deadline, make sure that you send at least the abstract alone.
2. You will receive a confirmation mail as soon as we have seen your abstract.
3. A team can submit only one abstract.
4. If a team sends in multiple submissions, only the first received submission (in chronological order) will be taken into consideration.
5. We cannot be held responsible for any delays in the delivery of your abstract/portfolio if you are sending it by post. Therefore, kindly ensure that you send in your documents well in time.
6. We assure you that all your documents will be kept confidential. We will not share your documents with anyone, or make use of them in any way.
7. Do send in your portfolio even if your robot is not complete. It will still be considered for the event.

Winning Criteria

A bot wins if its opponent is immobilized or thrown out of the arena. In case both the robots remain mobile at the end of the round, the winner will be decided under the rules as discussed in the scoring pattern.

Event Safety Disclaimer

Compliance with all event rules is mandatory. Each event has safety inspections. It is at the sole discretion of the inspection committee that your botwill be allowed to compete. You are obligated to disclose all operating principles and potential dangers to the inspection committee. Proper activation and deactivation procedures must be demonstrated mandatorily. Robots must be activated only in the arena, testing areas, or with expressed consent of the event co-coordinators. All weapons must have safety covers on any sharp edges. All participants build and operate robots at their own risk. Combat robotics is inherently dangerous. There is no limit to the safety measures or regulations that can cover all the dangers involved. Please take care to not hurt yourself or others while building and testing your robot. We will not be held responsible for any damage or injury that you or your team-mates may suffer during the course of the events.

Team Specifications

A team can have at most 4 members. Members can be from different institutions.

Robot Specifications

Size

1. The size of the bot can range from 600mm X 600mm X 800mm to 800mm x 800mm x 800mm (l X b X h).
2. Any external control devices or tanks are not included in the size constraint.

Weight Classes

1. Weight of the robot should not exceed 40 kg (pneumatics/tanks included).
2. If the tank is external, it's weight would be considered 1.5 times its actual weight.
3. Weight of external power source (batteries and adaptors) will not be counted.
4. Weight of wireless wheeled robots will be counted as 0.75 times the actual weight.
5. The robots can be of ROLLING or WALKING type.

Mobility

All robots must have easily visible and controlled mobility in order to compete.

Methods of mobility include:

1. Rolling (wheels/tracks/whole robot).
2. Walking (linear actuated legs with no rolling or cam operated motion). The classification of robots as "walkers" is left to the discretion of the event co-ordinators.
3. Shuffling (rotational cam operated legs).
4. Ground effect air cushions (hovercrafts).
5. Jumping and hopping is allowed.
6. Flying (airfoil using, helium balloons, ornithopters, etc.) is not allowed.

Robot Controller Requirements

1. Bots may be wired or wireless. Autonomous bots not allowed.
2. Tele-operated robots must be radio controlled by standard Hobby Radio Control equipment, or use an approved custom system as described below.
3. Tethered control is not allowed.
4. Pre 1991 non-narrow band radio systems are not allowed.
5. This event recommends, but does not require a separate power switch for the radio.
6. It is recommended to use 3 to 4 frequencies for your robot.
7. For wired bots, care should be taken so that wires do not get entangled.
8. The power supply should be 15-18 volt.

Radio system restrictions for this event with weight and or weapon restrictions:

1. Radio systems that stop all motion in the bot (drive and weapons), when the transmitter loses power or signal, are required for all robots. (This may be inherent in the robots electrical system or be part of programmed fail-safes in the radio).
2. All radio control systems must have a way to change frequencies or coded channels to prevent radio interference. Having at least two to four frequencies or coded channels available is recommended. Lack of extra frequencies may result in a forfeit. Priority for frequency use will be allocated in order of entry registration.
3. Non-standard or home-made control systems, must first be approved by the event co-ordinators.
4. All robots that are either heavier than 12 kgs must use radio systems on the FM band, or an approved custom control system.

Batteries & Power

1. Only permitted batteries are ones that cannot spill or spray their contents when damaged or inverted. This means that standard automotive and motorcycle wet-cell batteries are prohibited. Permitted batteries: Gel cells, Hawkers, NiCads, NiMh, dry cells, AGM, etc.
2. All onboard voltages above 48V require prior approval from the event co-ordinators. (It is understood that a charged battery's initial voltage is above the nominal value).
3. All electrical power to weapons and drive systems (systems that could potentially cause injury) must have an option for manual disconnection that can be activated within 15 seconds without endangering the person turning it off (i.e., no body parts in the way of weapons or pinch points). Shut down via disconnection of main battery power must be possible using standard high current switches (Hella, Whyachi, etc.), or via a removable link. Relays may be used to control power, but there must also be a mechanical disconnect. Please note that complete shutdown time should be less than 60 seconds (includes power to drive and weaponry).
4. Due care must be taken to ensure that the terminals of the robot's battery are protected, and do not short-circuit.
5. If your bot uses a grounded chassis, you must have a switch capable of disconnecting this ground. ICE robots are exempted from this rule if there is no practical way to isolate their grounding components.

Pneumatics

1. Bot can use pressurized non-inflammable gases to actuate pneumatic devices. Maximum allowed outlet nozzle pressure is 8 bar. The storage tank and pressure regulators used by teams need to be certified, and teams using pneumatics are required to produce appropriate safety and security letters at the Registration Desk. Failing to do so will lead to direct disqualification.
2. Participants must be able to indicate cylinder pressure with integrated or temporarily fitted pressure gauge.
3. The maximum pressure in the robot's 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 pressure.

5. Pneumatic systems on board the bot must only employ non-inflammable, non-reactive gases (CO_2, Nitrogen and air are most common). Particular attention must be given to the pressure vessel mounting and armor so that it does not leak even if ruptured. (The terms 'pressure vessel', 'bottle', and 'source tank' are used interchangeably).

Hydraulics

1. Bots can use non-inflammable liquids to actuate hydraulic devices like pistons or cylinders.
2. All hydraulic components on-board a bot must be securely mounted. Particular attention must be given to the pump, accumulator, mounting 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 robot should be leak-proof.
4. Maximum allowed pressure is 8 bars. Participant must be able to indicate the used pressure with integrated or temporarily fitted pressure gauge.

Rotational Weapons or Full Body Spinning Robots

Spinning weapons must come to a full stop within 60 seconds of power disconnection using a self-contained braking system. Robots can have any kind of magnetic weapons, cutters, flippers, saws, lifting devices, spinners, hammers etc. as weapons with following exceptions and limitations:

1. Liquid projectiles.
2. Any kind of inflammable liquid.
3. Flame-based weapons.
4. Any kind of explosive or intentionally ignited solid or potentially ignitable solid. Nets, tape, glue, or any other entanglement devices are not permitted.
5. High power magnets or electromagnets.
6. Radio jamming, tazers, tesla coils, or any other high-voltage device.
7. Tethered or un-tethered projectiles.
8. Spinning weapons which do not come in contact with the arena at no point of time are allowed. In no case should the arena be damaged.

Arena Specifications

1. Arena will be a rectangular area of dimension 3.5m X 3.5m.
2. A rectangular area of 70cm X 70cm at one corner of the arena will be the starting zone for the bot.
3. The two starting zones will be placed at the same end of the arena.
4. The arena will have holes. Pushing the opponent's bot into one of the holes will fetch points.
5. The arena will have pebbles. Pushing the opponent's bot on to the pebbles will fetch points.
6. The arena will be made of wood, and will be at a height of 0.5m above the ground.
7. The arena will have a central region marked by a square box