

## INTRODUCTION

*"The people's champion?" Sounds pretty good to me. This line of real steel just pumps up adrenaline in hard core robo fans. Well the clashes are really hard to resist. To all robo maniacs out there, Technex'19 presents the biggest and one of a kind opportunity. Get ready with your innovation caps and build a buddy which outlasts all. Endurance and strength being its prime weapons, equipped with wire gashing axes, scissors, pincers and maces makes 'indra' feel shame. Give it your all for a warrior never rests till opponent is crushed. See you around for the largest extravaganza where victory is not granted it is earned.*

## TASK

*Design a wired or wireless, manually controlled robot capable of overpowering its opponent in a dual combat.*

## GAMEPLAY

- *Teams shall compete against other teams and remain safe from the weapons on arena to be chosen at the discretion of organizers by a specific procedure.*

- *The total time duration of a match will be 6 minutes constituting of two halves of 3 minutes each with a timeout of 2 minutes. The scoring shall be done by the referee present at the arena.*
- *Scoring shall be done according to the design of arena explained elaborately in scoring section. All ties shall be resolved according to the specified rules and in case of force major situation, decision of organizers shall be final and binding.*

## TEAM SPECIFICATION AND ELIGIBILITY

**Eligibility:** *Students of any recognized engineering college are eligible to participate.*

**Team Specification:** *Any team can participate in Robowars, Technex. 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. Technex reserves 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.*

**Team Id:** *A team Id would be provided to each team and will be used as a mean for carrying out communication for all purposes.*

**Team Representative:** *Each team must specify their Team Representative (Leader) at the time of registration on the*

*website. All important communications between Technex 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.*

## **BOT SPECIFICATION**

### **Dimensions and Fabrications**

- *The machine should fit in a box of dimension 750mm x 750mm x 1000mm (l x b x h) at starting point of the match.*
- *The machine **should not exceed** 120 lbs including the weight of pneumatic source/tank*
- *The external device used to control the machine or any external tank is not included in the size constraint.*
- *The battery will be taken into consideration for the measurement to be made for the machine dimension and weight.*

### **Power Sources**

- *The machine can be powered electrically only. Use of an IC engine in any form is not allowed.*
- *Each team must prepare its own power sources. The teams have to bring their own battery eliminators.*

- *The voltage difference between any two points in the machine should not be more than 36V DC at any point of time.*
- *All connections should be made safe to prevent short circuits and battery fires. Any unsafe circuitry may be asked to be replaced; failure to do so will result in disqualification.*
- *Use of damaged, non-leak proof batteries may lead to disqualification.*
- *Change of battery will not be allowed during the match unless timeout is taken by either of the team.*
- *No provision will be provided for charging of batteries.*
- *It is suggested to have extra batteries 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.*

## **Mobility**

- *Methods of mobility may include:*
  - *Rolling (wheels, tracks or the whole robot).*
  - *Walking (linear actuated legs with no rolling or cam operated motion).*
- *Flying (using aerofoil, helium balloons, ornithopters, etc.) is not allowed.*
- *Any other method of mobility which leads the robot to lose contact with the ground is not allowed.*

- *The robot should not secure itself on the ring surface by using suction cups, diaphragms, sticky threads, glue or other such device.*
- *Jumping and hopping is not allowed.*

## **Robot Control Requirements**

- *Wired or wireless remote controls are allowed in the event.*
- *The wires inside the bots should be properly protected and insulated to prevent fire.*
- *The remote should have at least two frequency operations to prevent interference with other team.*
- *The robot wireless systems must have a way to change frequencies or coded channels to prevent radio conflicts.*

## **Weapon Systems**

- *Robots can have any kind of cutters, flippers, saws, lifting devices, spinning hammers etc. as weapons with following exceptions and limitations:*
  - *Any kind of inflammable liquid / liquid projectiles.*
  - *Smoke or dust-based weapons.*
  - *Flame-based weapons.*
  - *Any kind of explosive or intentionally ignited solid or potentially ignitable solid.*
  - *Nets, tape, glue, or any other entanglement device.*
  - *High power magnets or electromagnets.*
  - *Radio Jamming, Tasers, Tesla coils, or any other high-voltage devices.*
  - *Tethered or un-tethered projectiles.*



***Spinning weapons which do not come in contact with the arena at any point of time are allowed.***

## **Pneumatics and Hydraulics**

- *The robot must use non-inflammable and non-corrosive fluids to power pneumatic and hydraulic devices.*
- *Maximum pressure in the tank containing pneumatic fluid should not exceed the limit of 10 bars at any point of match and there should be a provision to check the pressure in the tank.*
- *All hydraulic liquids are required to be non-corrosive and your device should be leak proof.*
- *Participants must be able to indicate the used pressure with integrated or temporarily fitted pressure gauge.*
- *You must have a safe way of refilling the system.*
- *All pneumatic components on board a robot must be securely mounted. Care must be taken while mounting the pressure vessel and armour to ensure that if ruptured it will not escape the robot.*

## **RULES**

### **General Rules**

- There will be **two** rounds, **three** minutes each.  
Any team that is not ready at the time specified will be disqualified.
- In no case should the arena be damaged by any robot.
- The competition will be played on a Knock-out basis.
- A ROBOT will be declared '**KNOCKED-OUT**' if it is unable to travel a distance of 6 inches in 30 seconds.
- If no robot is immobilized within the time limit then winner will be judged on the basis of the points scored.
- The organizers reserve the rights to change any or all of the above rules as they deem fit.
- Violation of any of the above rules or any misconduct will lead to disqualification.
- Decision of organizers will be final and binding on all.
- **Change in rules, if any will be highlighted on the website and notified to the registered teams.**

## Scoring

Points will be given on the basis of aggression, damage and strategy.

**Aggression** – Points on aggression will be awarded on the basis of frequency, severity, boldness and effectiveness of attacks attempted by the robot against its opponent.

**Damage** – Points on damage will be awarded if the robot reduces the functionality, effectiveness or defensibility of an opponent either directly or indirectly. Damage is not considered relevant if a robot recklessly harms itself. Extra points will be awarded for dismantling opponent robot.

**Strategy** – Points on strategy will be awarded if the robot exhibits either a combat plan that exploits the robot's strengths against the weaknesses of its opponent or a deliberate defense plan that guards its weaknesses against the strengths of the opponent.

- Points will be awarded, once in a round, if the bot reaches opponent's starting point, which can be referred to as safe zone.
- Points of the opponent team will be deducted if their bot is pushed into the Danger zone (Remaining corners of the arena apart from safe zone).
- In no case should the arena be damaged by any bot otherwise points may be deducted.
- The Rules and scoring system are bound to change according to decision of coordinators and teams would be notified accordingly

## **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.



- *Special care should be taken to protect the on-board batteries and pneumatics, 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. 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.*
- *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 is 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 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.*

## **CERTIFICATION POLICY**

- *Certificates of Participation will be given to all the participating teams.*
- *Certificate of appreciation will be given to all the winners.*
- *The teams which get disqualified due to disobeying any of the competition rules will not be considered for the certificate.*

THE ANNUAL TECHNO-MANAGEMENT FEST, IIT(BHU) VARANASI

**TECHNEX'20**

## **ABSTRACT**

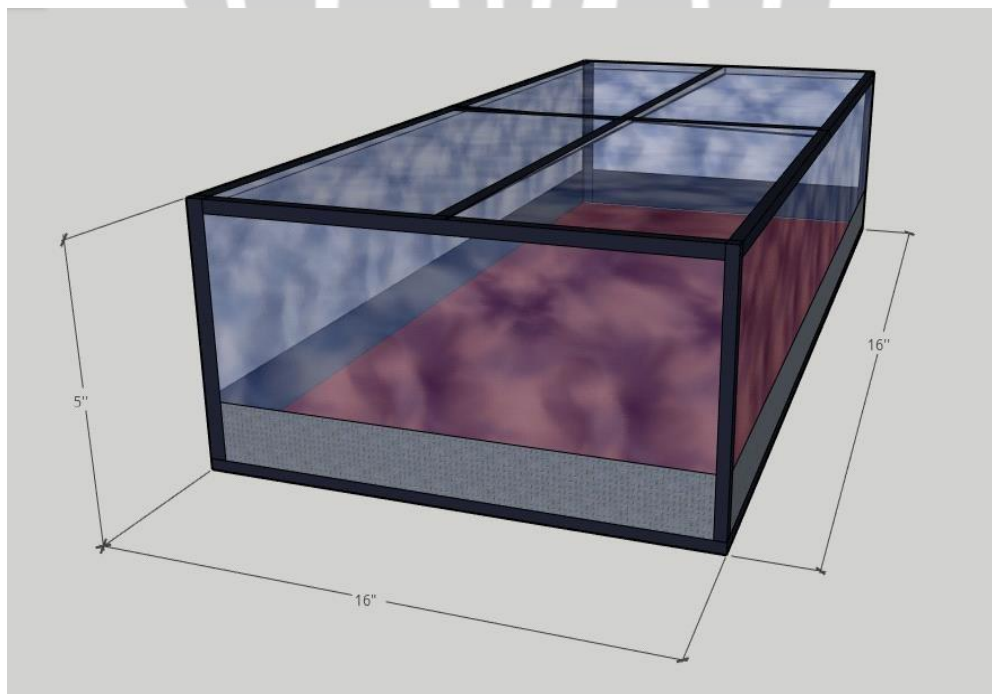
*The written abstract should be prepared on the following lines:*

- *The weapon systems and power supply method should be explained in detail, along with proper diagrams. Picture(s) supporting these must be attached.*

- *The specifications of all the components used, including motors, remote controller, wires, battery etc. have to be mentioned.*
- *If possible, a video showing the bot performance and the mechanism(s) being used must be attached.*

## ARENA SPECIFICATION

- *The arena base is made up of mild steel and dimensions are as shown in the below figure.*
- *Polycarbonate sheets will be set up about 4 feet high and 1 foot away from playing arena. Arena will be fully covered with polycarbonate sheet.*
- *Boundary of the arena will be of mild steel.*



**For further queries, please contact the following co-ordinators:-**

- *Sumit Kumar*

Contact No: -8005866938

E-mail – Id: - [sumitkr.student.met17@itbhu.ac.in](mailto:sumitkr.student.met17@itbhu.ac.in)

- *Sumeet Kumar Rai*

Contact No: - 7999266950

E-mail – Id: - [sumeet.krai.met17@itbhu.ac.in](mailto:sumeet.krai.met17@itbhu.ac.in)

- *Uddeshya Yadav*

Contact No :- 8787068223

Email – Id : - [uddeshya.yadav.met17@itbhu.ac.in](mailto:uddeshya.yadav.met17@itbhu.ac.in)

**Changes can be made from  
time to time. Stay  
updated!!**