IGNUS 19

Full Throttle

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Content

1. Task

Make a wireless remote-controlled machine, powered only by an IC engine, which can race against other opponents on an off-road dirt track with many obstacles.

2. Arena

The track will be an all-terrain track with sharp turns and big jumps. In this edition of Race, both speed and control will be important. The car should be able to cross bumps, rough patches on the track and out do the opponent's car while maintaining its stability and not compromising with its pace. The track will be an off-road track. Most parts of the track will be made up of mud, however at a few places wood and or pebble like materials may be used to create obstacles.

1) Despite organizer's efforts to keep the track's quality intact, the track is subjected to undergo wear and tear as machines run over it. The machine is expected to be able to perform on such a weakened track as well.
2) Multiple machines will race on a single lane track at a time.
3) A lap of the track is completed when the machine comes back to the start-finish line.

3. Machine Specifications

1. Machine should fit in a box of dimensions 700mm x 500mm x 600mm at any moment of time during the race. The external device which is used to control the machine is not included in the size constraint.

2. The machine should be controlled by a wireless remote-control mechanism throughout the race.

3. The machine parts may be roughly classified into structural and functional parts: Functional parts - Gears, differential gear, engine, springs, shock absorbers, servo motors (non-propulsion purposes only), batteries, wheels and wheel hub can be directly used as available in the market. Structural parts - Chassis, steering mechanism, shock towers and suspension (excluding upper suspension arm, suspension spring and shock absorbers), if built by the participants themselves, extra points will be awarded.

4. The tires must have a minimum diameter of 3 inch. You are advised to use tires of good width for better performance on dirt tracks

5. Brake Mechanism: It is compulsory to incorporate braking mechanism in the car. Any other part used in braking mechanism (including the brake disk) can be readymade. 6. Wheel Hub: Any part rigidly attached to the wheel hub will be considered as a part of it and hence can be readymade. An example here is that of the ball stud.

7. Steering Mechanism: Any part which is connected to steering rod rigidly i.e. has no degrees of freedom with respect to steering rod (example: heim joint http://en.wikipedia.org/wiki/Heim_joint) will be considered as part of steering rod.
8. Suspension mechanism: Any part rigidly connected to suspension arms or one with no degrees of freedom with respect to suspension arm will be considered as its part. For example, both the heim joint for the upper suspension arm and the stud rigidly connected to the wheel hub can be bought from the market.
9. If there are parts used in the concerned joint which are neither rigidly connected with suspension or the hub, steering system or hub; they can be used ready - made from the market.

4. Propulsion & Steering

1. The machine must use only mechanical power generated by an internal combustion (IC) engine for propulsion. Only one IC engine should be used in

the machine. Use of any other sources such as chemicals, compressed gas, rockets etc. is not allowed.

2. Any machine which uses DC Motors for propulsion will be disqualified. However, DC
motors and servos can be used for steering mechanisms or any other control mechanisms apart from propulsion.
3. The machine must have an on-board power supply to run any mechanism requiring electric power.

4. The maximum allowed capacity of IC engine to be used is 4.6 cc (i.e. Participants can also use 2.5 cc, 3 cc, 3.5 cc or any other IC engine lower in capacity).

5. The electric voltage anywhere in the machine should not exceed 12V at any point of time.

6. There shall be a countdown preceding the start of the race. No participant is allowed to touch the machine during the countdown period.

7. Providing a clutch mechanism between the engine and the wheel would prove useful, as it would prevent the engine from dying out at any stage of the race.

8. Participants are advised to use a proper cooling mechanism to prevent overheating of the engine.
9. Participants are advised to use sway bars for better control and stability.

10. The participants are advised to use proper air filters as dirt might cause serious problems to the engine.

11. Readymade wheels are allowed.

12. The machine will be inspected and if found to be dangerous, the team will be disqualified. This decision rests solely with the judges and the organizers

5. Game Rules

1. The top teams from the qualifying rounds will make it to the second round.

2. After the qualifying round, there will be races between multiple cars at a time. So, the participants must use a remote with frequency of band spectrum 2.4 GHz.

3. The track will have check points at regular intervals. If a machine tumbles, halts or goes off the arena at any point on the track, one of the team members is allowed to lift it up and place it at the nearest checkpoint behind that point. The time shall still be running in the meantime.

4. Team members are not permitted to touch either their machines or those of their opponents once the race begins (unless there is need to lift the machine as stated in fourth point). The penalty for doing so is disqualification

5. In the qualification round, a maximum of two team members are allowed from a team in the racing arena while in the final round only one of the team members will be in the racing arena except the controller.

6. Teams are not allowed to purposefully damage the machine of the opponent's team. If found doing so on track (while racing), the concerned team will be disqualified. Execution of last three rules will be subjective and relies completely on judges' and organisers' discretion.

6. Judging Criterion

All decisions taken by the organizing team will be deemed as final, and no more changes will be encouraged, thus holding the full authority to change any of the above rules as per circumstances.

The written abstract should be prepared on the following lines:

1. Description of any unique/ advantageous mechanism used.

2. The specifications of ALL the components used, including engine, suspension springs, remote controller etc. have to be mentioned.

3. An email will be sent to the team leader confirming the reception of the entry.

4. Each team is allowed to make one submission only. In case of multiple submissions, the Ignus 19 last submission before the deadline will only be used for judging purposes.

Note: All the portfolios will be used strictly for the elimination purposes. Ignus takes the responsibility that no information will be made available to any third party. The portfolio of your machine will be helpful everywhere in future as an evidence of your hard-work, along with determining your position for the competition. So please pay adequate attention to it. The portfolio is meant to assess the efforts put in by participants. Thus even if you are not able to meet the requirements asked in the portfolio, please send us the portfolios based on the current state of your machine before the deadline. That means even if your machine is incomplete, please send the portfolios anyway, instead of not sending them or requesting permissions for sending them late.