



Agni Shamak

The fire fighter



Introduction: -

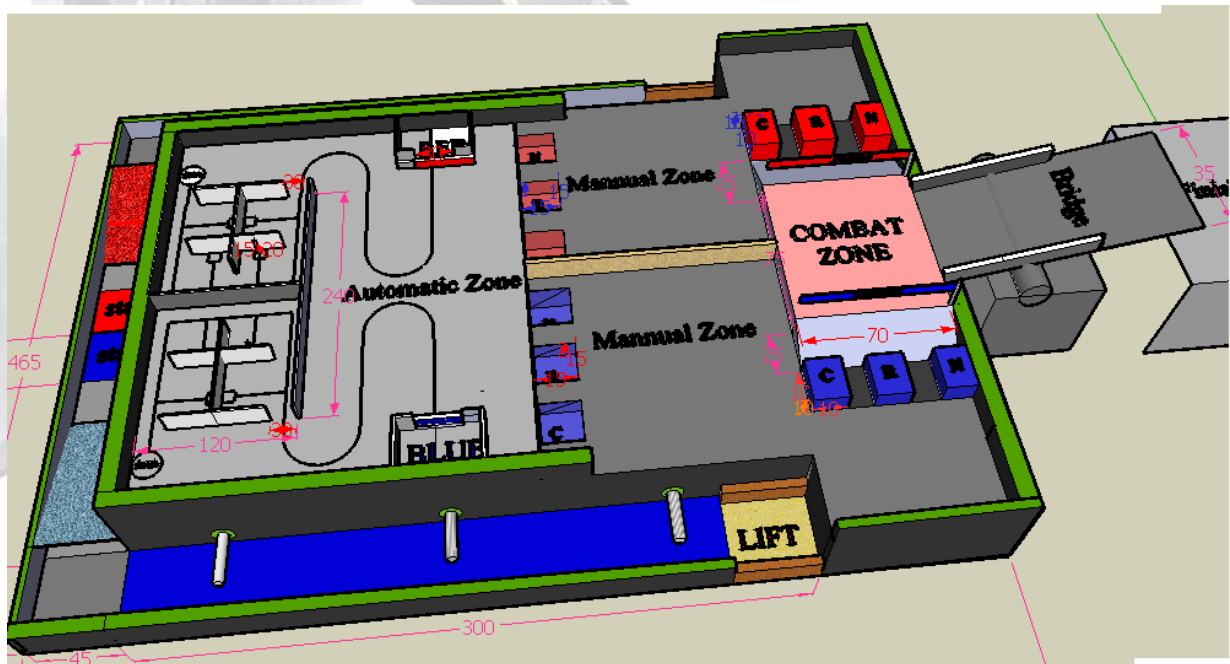
Prepare two bots, one autonomous and one manual bot. The manual bot have to reach finish zone by avoiding various obstructions during successive checkpoints. Autonomous bot have to follow the white line to four rooms where bot have to extinguish the burning candle(s).

Arena Description:

There will be two teams competing for finish zone i.e. RED team and BLUE team.

The arena is divided in two parts

- 1: Manual zone
- 2: Automatic zone



Main Arena

Manual arena:-

Manual arena has 3 checkpoints.

Starting zone.

The starting position of manual bot is shown in figure 1.

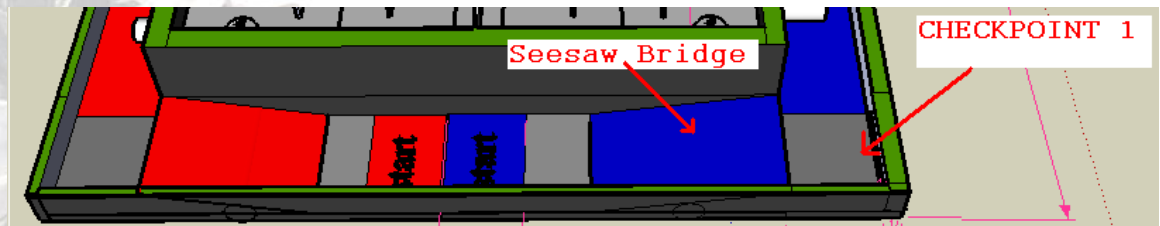


FIGURE 1

The bot have to start from the starting position (see in fig 1) and move towards checkpoint 1. For completing this task bot have to go through the Seesaw Bridge (i.e. as you move forward on bridge it will turn downwards to other side). **Angle of the bridge is 15 degree.** Once you successfully cross the bridge the gate of safe room (room where the automatic bot is placed initially) will automatically open, and your automatic bot should start its mission. After crossing the bridge you have to move towards checkpoint 1.

Spike zone

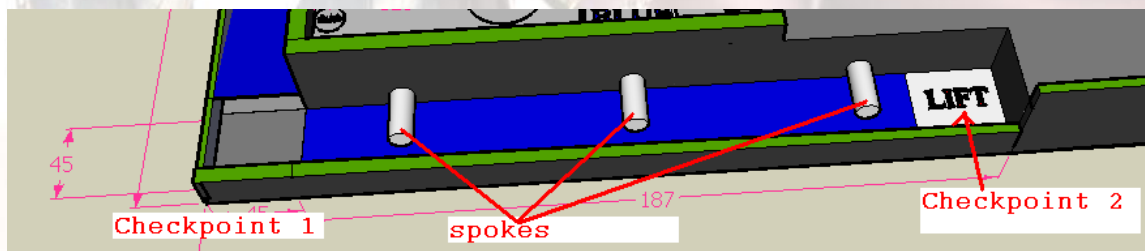


Figure 2

After successfully reaching at checkpoint 1 bot has to move towards checkpoint2 avoiding the spikes that are popping out from the wall at regular intervals.

There will be penalty if your bot touch any of the spikes (see rules & regulations).

Checkpoint 2 is a lift to the main arena. The lift will be moving up and down at regular intervals of 10-15 secs.

Manual zone

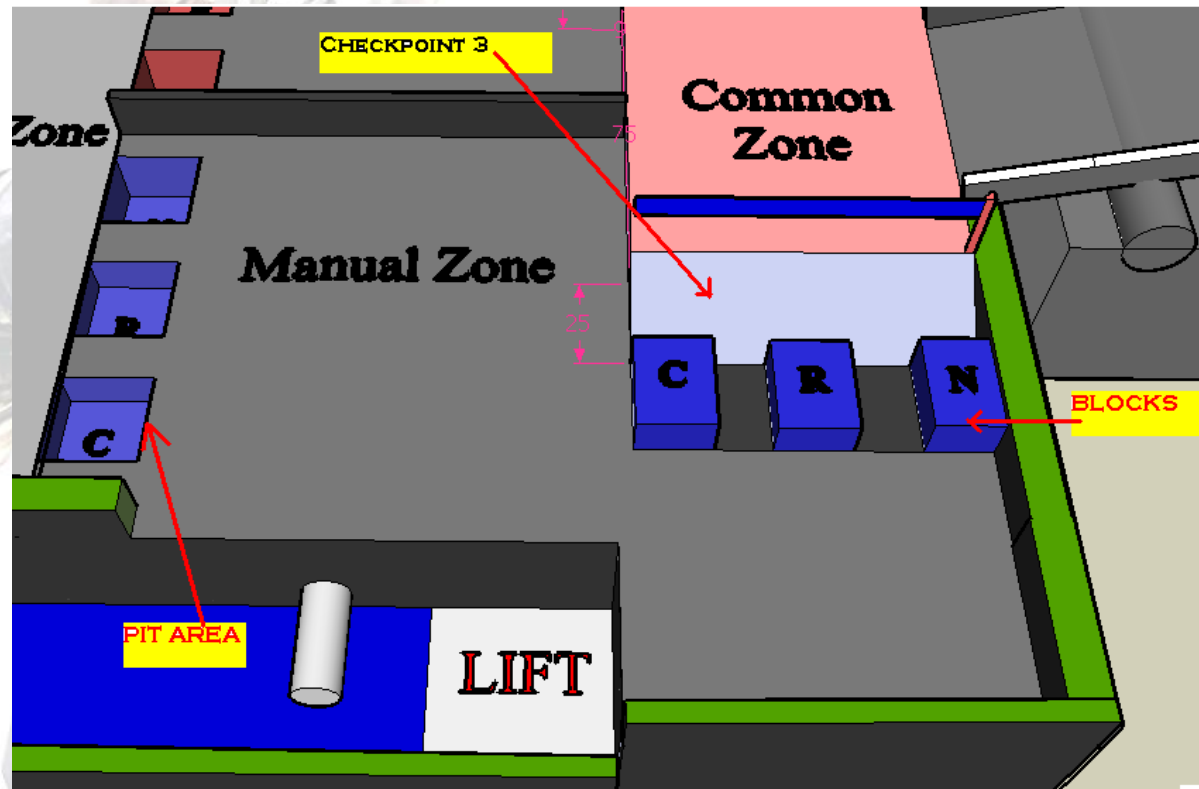


Fig 3

After the bot make it to the lift it should be ready for the manual zone. In this zone bot is supposed to put the three blocks in their respective pit areas (i.e. block marked with N should be in placed in pit marked N).

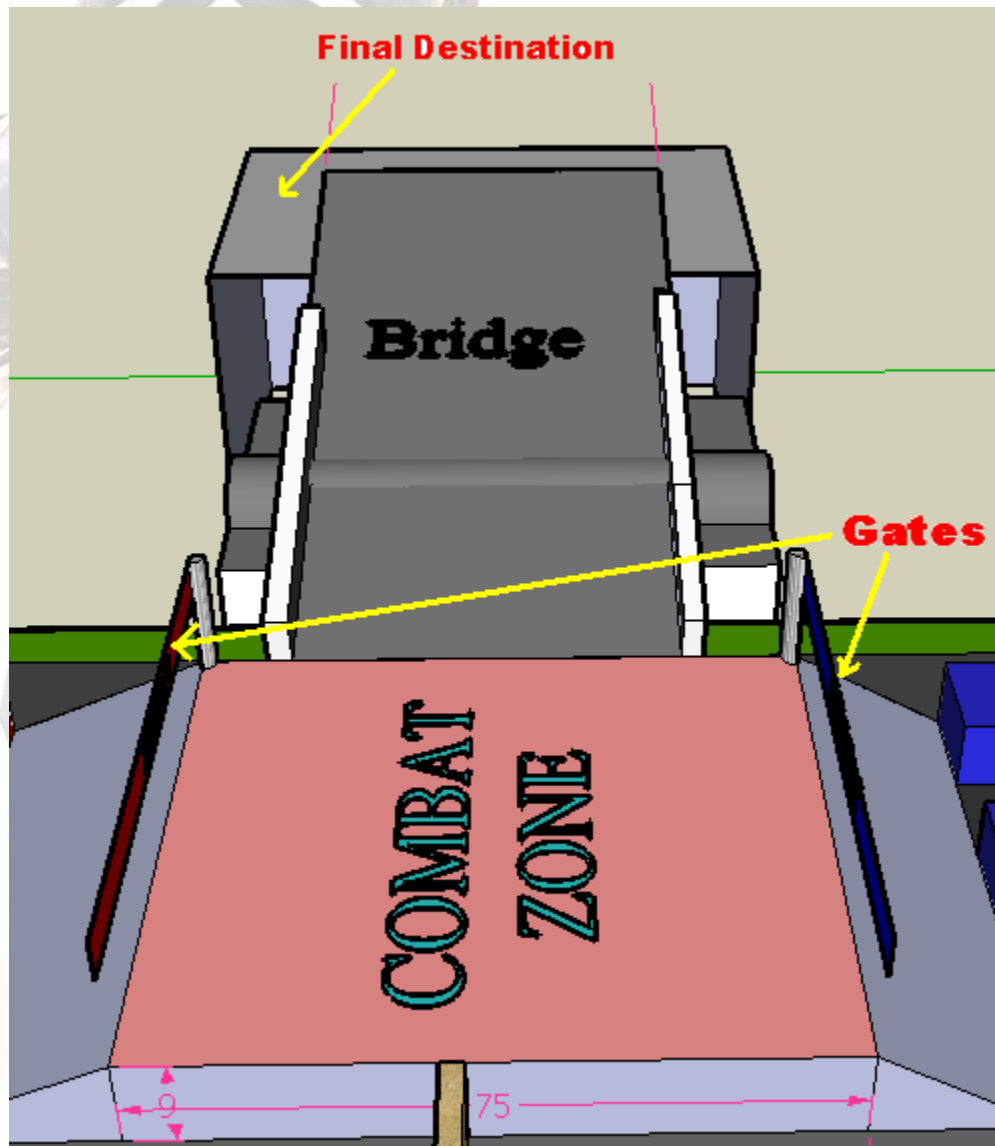
The block should be completely inside the pit, no part should be on the main arena.

The blocks are cube of 10cm & made up of thermocol. The dimension of pit is 15x15x2.

This zone may have some dynamic obstructions (disclose on the spot).

After successfully placing all blocks in pit areas bot should move towards checkpoint 3.

Combat Zone



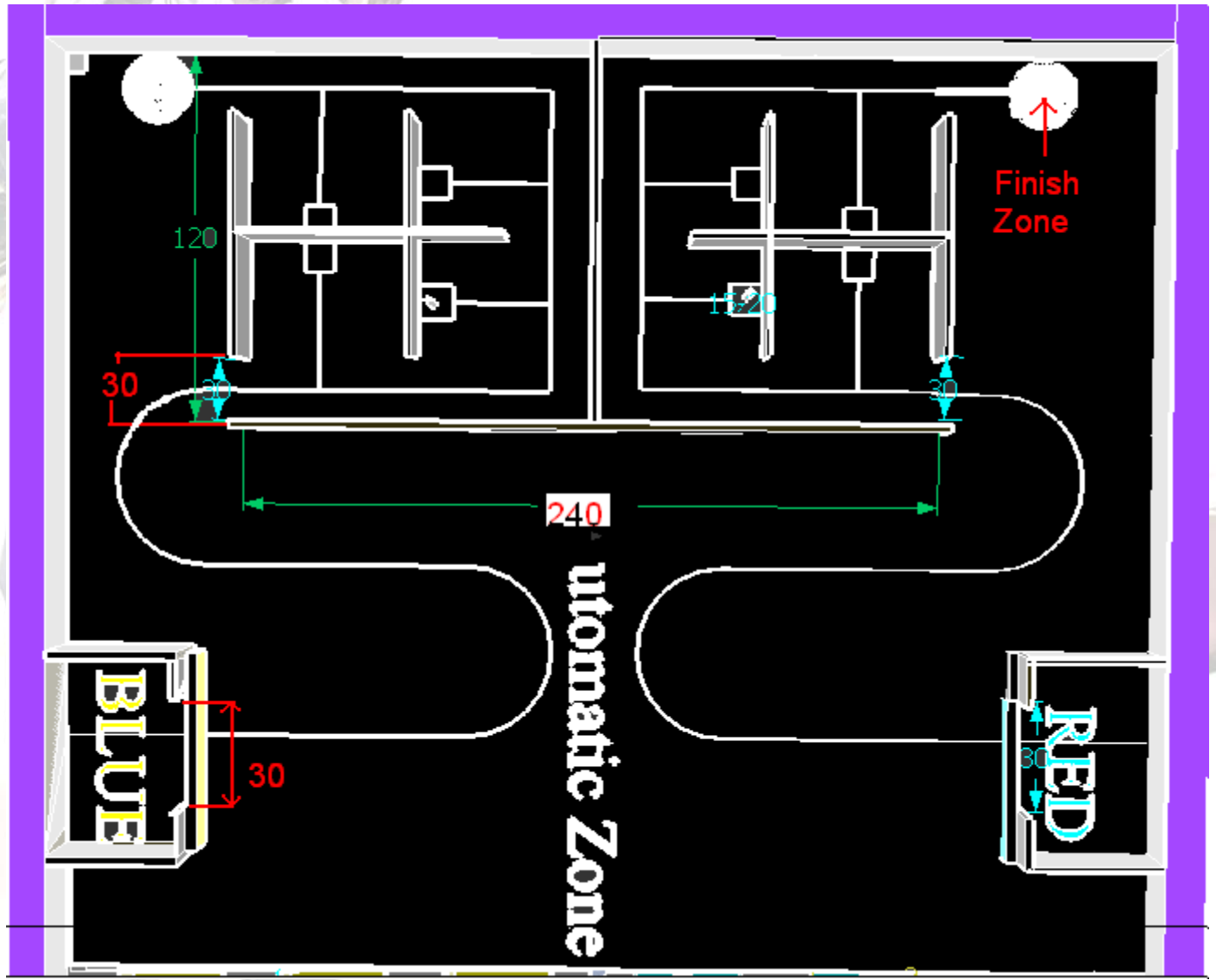
After reaching checkpoint3 your bot should be ready to enter combat zone. The gates of combat zone will be opened in last 1 min of the game. So we are expecting that bot should be ready to enter in combat zone in last 60 secs. Combat zone is the only zone where the bots of both team can touch each other.

In this zone both bot can fight for the bridge which will lead them to FINAL DESTINATION(the manual bot's goal).

This bridge is also a seesaw bridge.

The bot who reaches the final destination first will get the points for the goal.

Autonomous arena:-



Automatic zone is shown in fig.

Manual bot is not allowed to enter in this zone. This may lead to immediate disqualification (if intrusion seems intentionally).

Once the manual bot had cross the seesaw bridge in starting zone the door of safe room will be automatically opened.

After the door is opened your autonomous bot **can** follow the **WHITE** line on **BLACK surface**(but it is not necessary to follow).

Width of white line is 3cm.

Main task of automatic bot is to search for the **burning candles** and extinguish them.

There are four rooms and candle(s) are placed in any of the rooms (position of candles will be disclosed on the spot).

Position of candles will be same for both teams.

Candle is mounted on a stand but the height of flame from ground level is between 15-20 cm.

The candle is placed in a square of white line (see fig).

The fire extinguishing mechanism should be activated only when there is candle.

The bot cannot touch the candle; this may lead to high penalty.

If bot touches the candle and burning candle gets extinguish, then no points will be rewarded.

Wrong use of fire extinguishing mechanism may lead to high penalty (see scoring criteria).

Once bot successfully traverse all four rooms it is suppose to stop in finish area.

The bot has to indicate the burning candle by red led.

Autonomous bot **must** have a fire extinguishing mechanism and this mechanism should be activated after the bot has indicated candle with red led.



RULES & REGULATIONS

MACHINE SPECIFICATIONS:

- The size of the manual machine must be fit within a cube of 30cm and autonomous bot should fit in a cube of 25cm before the game begins.
- ONLY TWO machines are allowed for each team.
- The machine has to be operated via remote control using a cable connected to it or remote control using infrared rays, visible rays or sound waves. Radio wave remote control is also allowed but organizers will not be responsible for any interference.
- Operators are not allowed to ride on the machine.
- Team members are not allowed to touch the machine once the game begins.

METHOD OF CONTROL:

- Manual bot should be controlled by a single operator.
- The manual operator is not allowed to enter into the arena so use wire of suitable length.
- Another team member has to start the autonomous bot & leave the arena once the autonomous bot is ON.
- Only team member can hold the connecting wire.

POWER SUPPLY:

- Each team shall prepare its own power supply.
- Direct A.C. supply will be given for all the teams.
- In **manual bot** the D.C voltage should not exceed **24v** in any case.
- There should be **onboard power supply** for autonomous bot and it should not exceed **24 volts** i.e. voltage between any two points should not exceed 24 volts.
- **No** external supply would be allowed for autonomous bot.

WEIGHT:

- The weight of the manual machine to be used in the game field must not exceed 4 kg.
- The total weight does not include the weight of power sources, cables, and remote controller.
- Power supply of manual bot should be OFF-BOARD.

SIZE:

- Once the Manual Machine leaves the start zone after the game begins, its size can be changed freely.
- It should not split into multiple bots.

GENERAL RULES:

- Each team can consist of at most four members.
- The duration of each match is 5 minutes which may change.
- There is one trump card for manual bot. With the help of trump card, operator can touch the manual bot for a period of max 60 sec but opponent will continue with their game.
- In any case of autonomous malfunctioning, the bot can take retry but timer will be continuing and retry will be from safe room (open gate).
- Radio waves can be used for controlling the manual robots (organizers are not at all responsible for any RF interference).

- In manual bot, Lego kits are strictly not allowed. Parts of toys like motors, gearbox, and wheels can be used but direct toy car base is not allowed.
- **Readymade microcontroller boards are allowed** but readymade **legokits are not allowed.**
- In case of readymade microcontroller boards the participant has to explain the board.
- Manual bot of any team cannot enter into the manual zone of opponent's team. This may lead to disqualification.
- The blocks marked X should be placed in pit marked X. Bot would not be allowed to enter into combat zone if this condition is not fulfilled.
- The block should be completely inside the pit i.e. no part of block should touch main arena.
- There may be an elimination round subject to number of participants.
- Rules may be updated on the game field before beginning of the event.

SCORING SYSTEM:

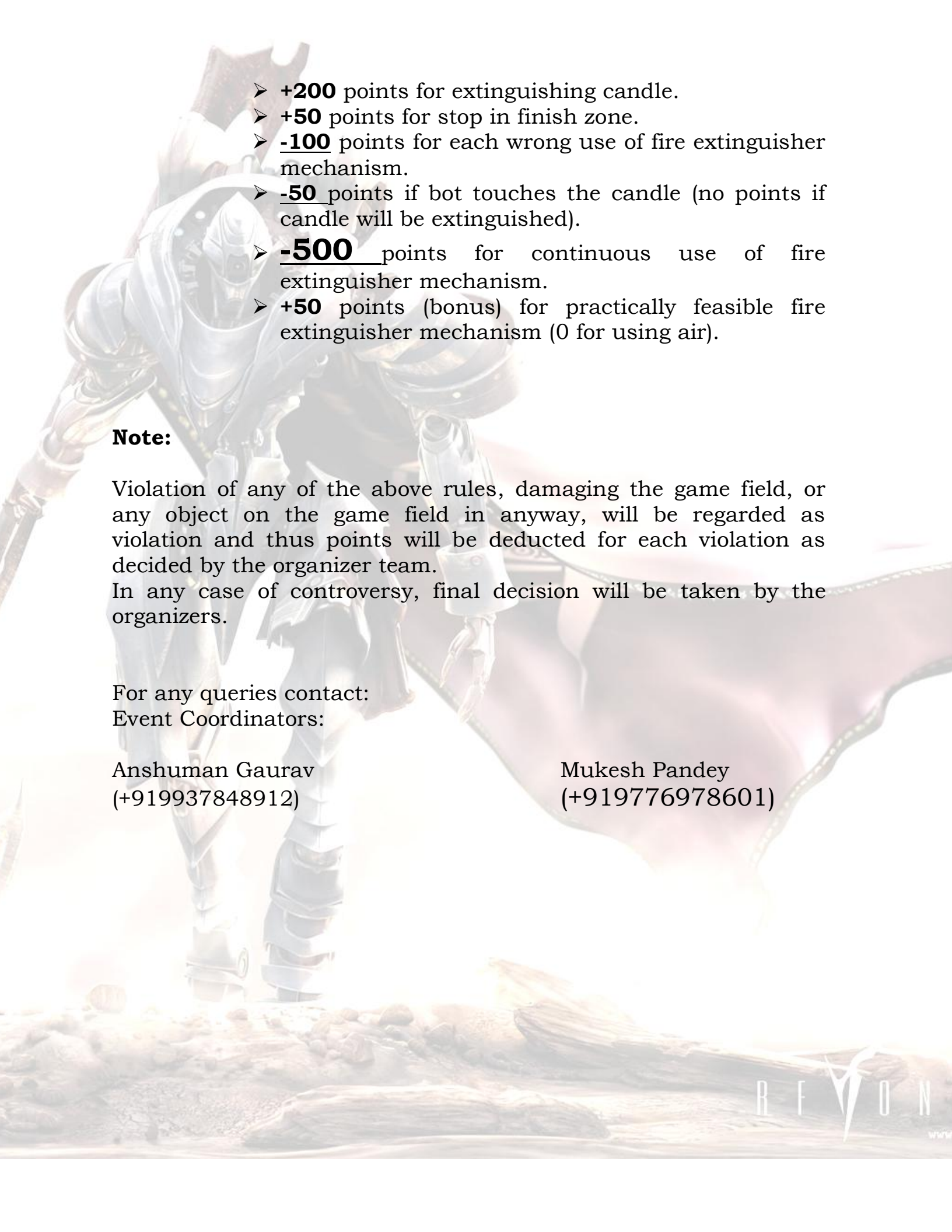
- The winner would be declared on the basis of total points scored by both autonomous bot and manual bot.

- **Manual bot:**

- | | |
|--------------------------|---|
| ➤ Reaching Checkpoint 1 | +50 points |
| ➤ Checkpoint 2 | +100 points |
| ➤ For placing each block | +50 points/block |
| ➤ Checkpoint 3 | +50 points |
| ➤ Finishing zone | +150 points |
| ➤ If bot touches spokes | -20 points * (no. of times bot touches spokes) |
| ➤ Trump card | -20 points |

- **Autonomous bot:**

- **+300** points for coming out from safe room.
- **-time (in sec.) a bot takes to reach final zone.**
- **+50** points for successful entry in first room.
- **+50** points for each right indication of candle (by led).

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- **+200** points for extinguishing candle.
 - **+50** points for stop in finish zone.
 - **-100** points for each wrong use of fire extinguisher mechanism.
 - **-50** points if bot touches the candle (no points if candle will be extinguished).
 - **-500** points for continuous use of fire extinguisher mechanism.
 - **+50** points (bonus) for practically feasible fire extinguisher mechanism (0 for using air).

Note:

Violation of any of the above rules, damaging the game field, or any object on the game field in anyway, will be regarded as violation and thus points will be deducted for each violation as decided by the organizer team.

In any case of controversy, final decision will be taken by the organizers.

For any queries contact:
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