

## MANUAL ROBOTICS - PICK AND PLACE

### ➤ Mission :

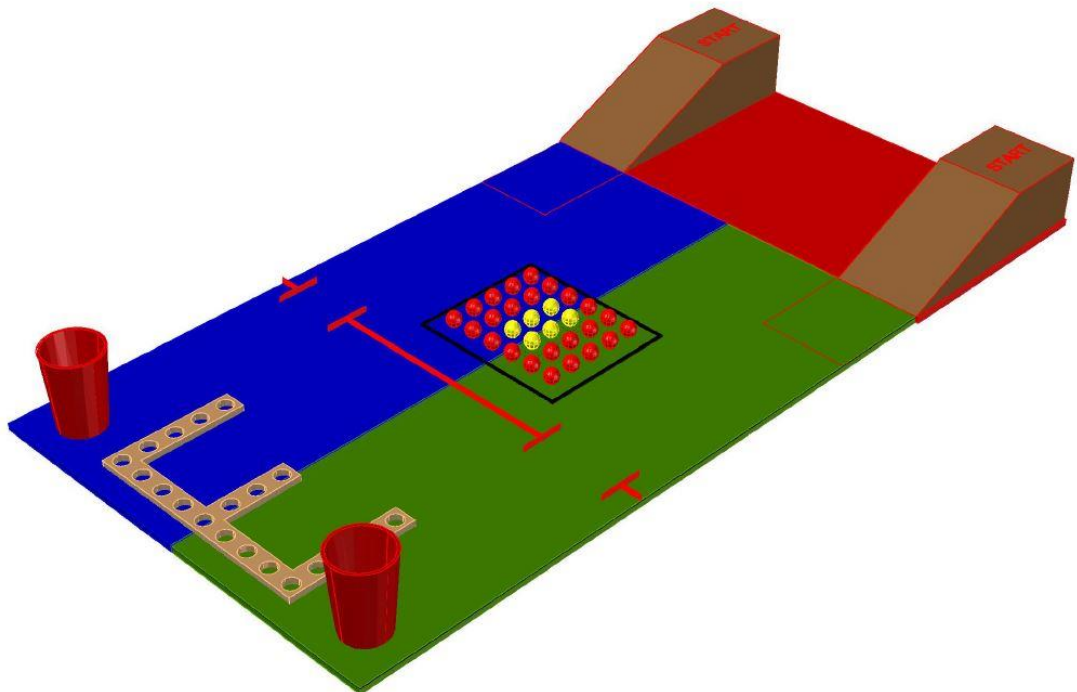
Mission is to collect maximum number of balls in a limited time by completing the following Tasks / challenges.

Each team has to build one Manual Robot for completing the challenge. Team should have 5 members.

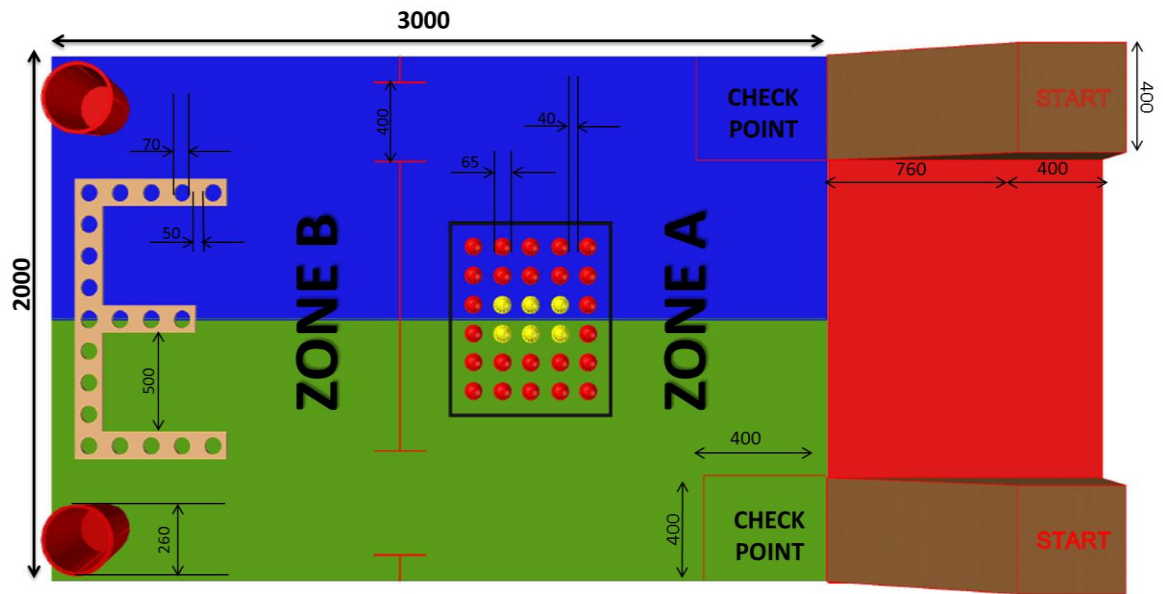
### ➤ Tasks for Robot :

- As soon as match begins, robot has to Getting down a ramp which is at a height of **300mm** with an inclination of **22.5 degrees**.
- After that robot has to go for the common ball zone and it has to pick the balls(as many as It can pick)
- Then it has to go along with the ball through the passage to enter into the zone B and place the balls either in the basket or in the holes provided.

### ➤ ARENA



*Isometric view of Arena*



***Top view of Arena with dimensions***

## PROCEDURE

- The game is a one-on-one match. On the blow of the whistle the game begins.
- Each game lasts for 5 minutes.
- At the end of 5 minutes game will be ended by a blow of whistle.
- One minute shall be provided for setting up of Robots before the match.
- Only one member of each team will be allowed to enter into the game arena and another member can help him from outside of arena.
- Only one team member is allowed to control the robot.
- The robots shall be placed in their respective starting zones at the beginning of the match.
- After blow of whistle Robot has to down a ramp then it has to enter into the game arena.
- Ball zone wall thickness is 5mm or less.
- After that it has to pick the ball/balls from the ball zone and go along with the ball towards zone B. Robot can pick any ball in the ball zone without entering into opponents region (which is specified with different colour).
- Robot may cross the ball zone walls to pick the balls.
- To get into the zone B it has to go through a passage of **400mm**.
- Then it can drop the ball in either basket or slots provided in the 'E' shape.
- One can place the balls in any slot of the E shape without entering into the opponent's region (which is specified with different colour).
- If one team suffer with dropping the balls in E shape then they can drop the balls in the basket.
- Points will be allocated for dropping the balls in basket or E shape accordingly (points are different for basket and E shape. Balls placed in 'E' shape can get more points).
- After that it has to return through passage to ball zone to repeat the process till the maximum given time.
- Middle balls of the ball zone are in different colour which worth more points.
- The team which gets more points can win the match.

## SCORING

- For getting **down to the ramp 20 points** will be allocated.
- For placing the red balls **in basket-** for each ball **10 points** will be allocated.

- For placing the centre balls having different colour in **basket**- for each ball **20 points** will be allocated.
- For placing the balls **in E shape**- for each ball **5 additional points** will be allocated.
- The team which places the balls in common slots of **E** can get **5 bonus points** (for each ball).

### ➤ VIOLATIONS

- Bots are not allowed to cross over the walls (except the ball zone wall) or damage them.
- For every violation teams have to start the robot which made violation from the checkpoint.
- Operator should not touch robot other than at the time of retry.
- Operator shouldn't disturb the arrangement of balls in the ball zone.

### ➤ PENALTIES

- If the operator touches the ball **10 points** will be deducted.
- If the operator touches the bot (except at the time of retries) **10 points** will be deducted.
- If the operator intentionally pulls the bot using wires **10 points** will be deducted.
- If a robot goes into opponent's arena or goes outside the arena **10 points** will be deducted.

**NOTE:** Penalties will be given by coordinators and coordinator's decision will be final.

### ➤ RETRIES

- In case of any technical issues in the robot, the robot can be taken out to the boundary of the arena with the concern of co-ordinators.
- A retry can be opted at any time in the match. This retry can be opted for as many times as necessary without any penalty.
- The referee needs to be informed before going for a retry.
- For every retry, robot has to be started from the checkpoint.

### ➤ ROBOT SPECIFICATIONS

- Each team shall use only one manual robot.
- Maximum dimensions of the robots at the start of the game are 350mm x 350mm x 400mm
- The robots can extend after the start of the match.
- The robots must not use ready-made parts and shall be designed and constructed by the students themselves, failing which the team will be disqualified.
- Manual robots have to be operated by means of cable connection. The length of the cable should be at least 2 meters. Wireless radio control is permitted.
- In case of wireless control, teams must have a dual frequency channel, so that even if there is one more team using it, the communication should not interfere.
- The manual robots can be powered with any DC power source (DC battery). The maximum voltage between any two points should not exceed 12V.
- Hydraulics or chemical energy should not be used for any mechanism.
- Pneumatics can be used and in case of use the pressure should be less than 6 bars.
- If a team is using Li-Po or Li-ion batteries, it is the team's responsibility to make sure there is no risk involved in its usage.

## RULES AND REGULATIONS

- A robot cannot split into two or more subparts. Subpart implies a robot which has a drive mechanism of its own.
- The manual robot operator can walk on the arena but should not disrupt any part of the arena.
- Operators are allowed to touch their corresponding robot only during a retry & before the match starts.
- All the statements written in this Problem Statement form the official framework of the rules to be followed by the teams. Violation of any statement in the Problem Statement may lead to disqualification.
- Damage to arena is unacceptable and will lead to instant disqualification.
- The robot exceeding the dimensional constraints shall be disqualified.
- Referees have all rights to ask the teams to produce the additional explanations on design issues. Also the referees can ask for additional explanation on the safety of the robots if required anytime during the event.
- Participating robots will be checked and tested, according to these rules and regulations.

### **NOTE :**

- 1) Game field dimensions are subject to a tolerance of  $\pm 5\%$ . No tolerances will be given in case of maximum bot dimensions.
- 2) The authenticity of any action not provided in this problem statement shall be subject to discretion of Coordinators.

**Note: - All decisions by the coordinators are final and binding.**

**For any quires feel free to ask co-ordinators**

Ramachandra Rao J                      9160955042

Dhilliswara Rao P                      8096982506