

# PROBLEM STATEMENT

## GOLDBERG'S ALLEY

### INTRODUCTION

*"Rube Goldberg, a comically involved, complicated invention, laboriously contrived to perform a simple operation"*

"Back to The Future", Its time for futuristic ideas and leave the simplicity! Think outside the box and let your insane minds rule you. Grab all your gears and justify its worth by forging it to accomplish the craziest tasks.

"Talent hits a target no one else can hit. Genius hits a target no one else can see." To all the fanatics out there, get a chance to exhibit how you perceive the world by unleashing yourselves in The Goldberg's Alley Challenge at Technex '20. We accept the craziest of ideas and yes we do reward them.

Got you hooked yet?

### TASK

To design a Goldberg's machine capable of completing as many tasks as possible from the given set of three tasks.

Three Aims-

1. Shooting a dart on the dart board situated 1.5m away from the arena.
2. Knocking out bowling pins situated 2m away from the arena.
3. Hitting a hammer on the hit hammer game machine.

### BONUS

This task is a bonus which gives additional points.

1. Bounce a ball into a basket.

### RULES & REGULATIONS

- Dart board will be fixed on a table 1.5 m away from the arena, height of its centre being as per participant's requirement, ranging from 30 cm to 80 cm above the ground. The points will be awarded according to the region where the dart hits the dart board.
- Bowling pins will be placed in the conventional manner 2m away from the arena. The ball for hitting the pins will be provided by us only. The points will be awarded according to the number of bowling pins they knockout.
- A hit hammer game machine will be placed just outside the arena. The participants would have to hit as hard as possible on the hammer hitting spot of the machine, the points will be distributed based on how high the label of the machine goes.

- Basket will be placed outside the arena. Distance ranging from 20cm to 60cm. height of basket will be 50 cm above the ground.
- Teams are requested to bring two printed copies explaining their contraptions in brief.
- Teams have to somehow compulsorily use the following items in their contraptions-
  1. Motor
  2. Magnets
  3. Ball Bearing
- Teams are requested to report to the arena room at least 2 hours before the starting of the event, so that they have ample time to set up their contraption systems, otherwise, they face the risk of being getting disqualified!
- A maximum of **2 trials or attempts** is allowed. However, if a team takes more than a trial, then the best of the two will be considered.
- **Human interferences are allowed** in case any step fails to get initiated but points will be deducted as given in the scoring pattern and the team will be allowed to restart from the upcoming step. **If the number of interventions exceeds 10, then that particular trial will be canceled!**
- Judges' decision shall be final and binding to all.
- **Two team members** may interact with the contraption system once the evaluation has begun. This includes resetting the machine.
- The number of members in a team is restricted to **5**. Students from different educational institutes can form a team.

## SCORING PATTERN

- Each **working** step will award you 10 points.
- Each type of energy conversion will award you 30 points and in case of reverse conversion, it will be counted as a normal step. **Only those energy conversions will be counted that actually contribute to the final aim of the contraption system.**
- Parallel steps will award you bonus points as explained- 25 points will be awarded for doing two steps parallelly, 50 points will be awarded for doing three steps parallelly and 100 points will be awarded for performing 4 or more steps parallelly.
- Each of the bonus tasks will be award 60 points.
- Each of the three given tasks carries a maximum of 100 points.
- **The use of the second attempt will lead to a deduction of 30 points from the total score.**
- Each human intervention will lead to a penalty of 5 points for the first two interventions and 10 points thereafter.
- Extra 10 points will be awarded for proper explanation/description of your contraption system to the judges before the start of your task.
- In the case of a tie, the winner will be the one with a higher average score of two rounds.

## DESIGN SPECIFICATION

- The arrangement should fit into an area (**2m x 2m**) with no restriction on the height of the system.
- The contraption should have a minimum number of **10** steps. However, there is no limitation on the maximum number of steps.
- The **step** is defined as an action that results in another action working towards the final aim of the system. **Repeating steps will not be counted** (e.g. if you have 2 steps containing dominos, then they both will be treated as a single step!)

- A parallel step is defined as the action which initiates two or more steps at the same time. Both the initiated steps must have some contribution towards the final aim of the system and also merge before the aim.
- There should be at least 4 different energy conversions (e.g. kinetic to potential energy, chemical to electrical energy etc.). Only those energy conversions will be counted that actually contribute to the final aim of the contraption system.
- No loose electrical connections will be tolerated in the arena room.
- No hazardous materials or explosives can be used on the machine although the use of controlled fire is permitted.
- Participants will be provided with a power supply of 230 V-50 Hz if needed.

## CONTACTS

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