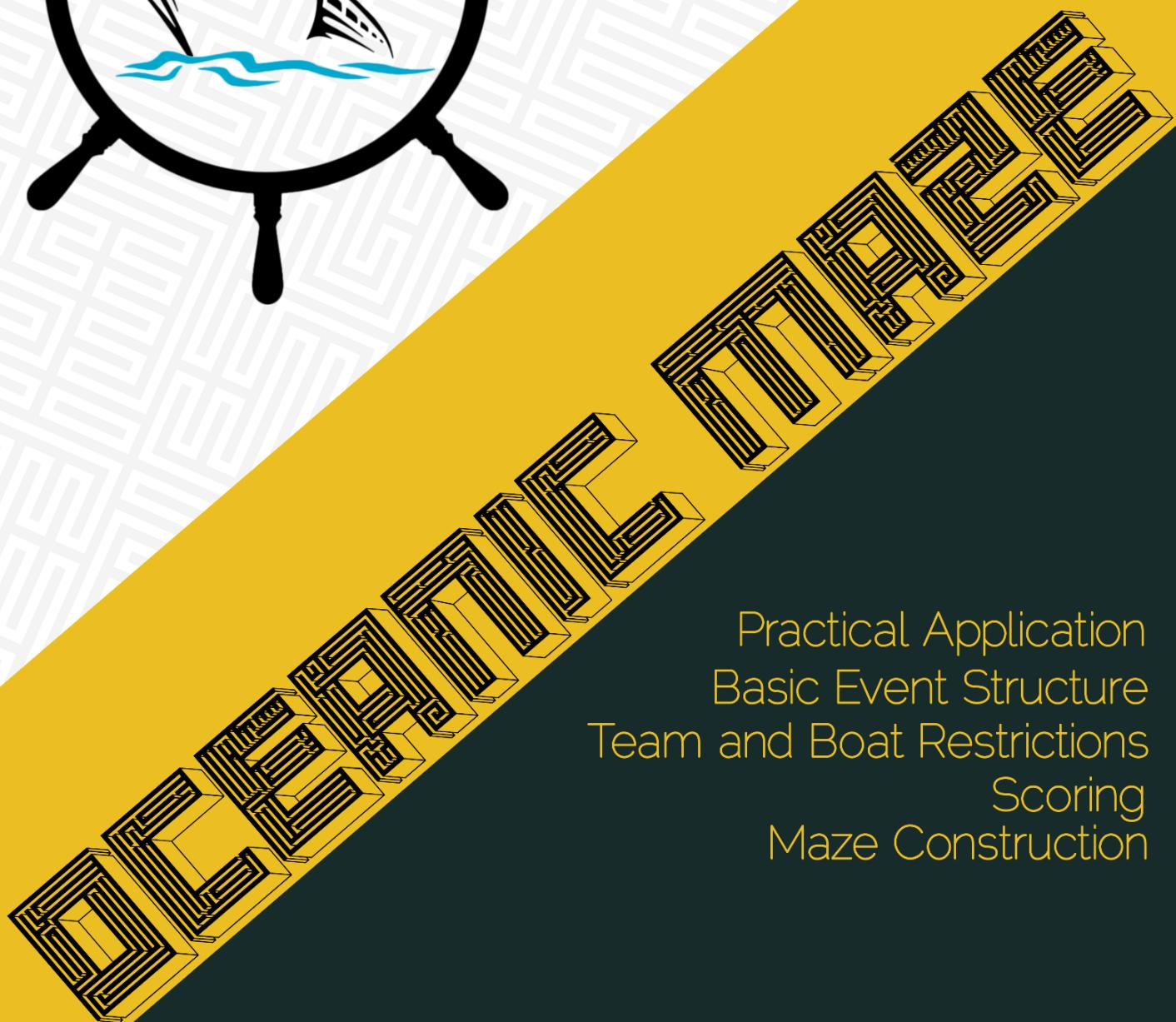


SAMUDRAMANTHAN

12th
edition



Practical Application
Basic Event Structure
Team and Boat Restrictions
Scoring
Maze Construction

Indian Institute of Technology
Kharagpur



PRACTICAL APPLICATIONS

Navigation and manoeuvering are of paramount importance, especially when it comes to the domain of port and inland transportation. Along narrow channels and straits, the ability of a vessel to hold its path along the required course plays a major role in ensuring that collisions and other untoward incidents do not occur. This event challenges participants to come up with innovative designs and construct model vessels and ships can safely navigate through narrow and constricted paths, in the form of a maze.

BASIC EVENT STRUCTURE

The competition will consist of two main rounds. After the first round, the bottom 30% of teams will be eliminated. The remaining teams will then progress to the final round, where they will compete head to head in a final challenge.

In **round 1**, the contestants are required to navigate through a preset maze without colliding against the boundaries. The objective is to design the fastest vessel with the highest manoeuvering prowess. A specialized detection mechanism will record the number of collisions, and scoring will be done on the basis of this, distance traveled and time taken to complete the task. The mechanism to detect collisions comprises a series of balloons tethered on to each vessel, which when colliding with the maze walls will come in contact with sharp nails. On contact, the balloons attached to the

vessel will burst, indicating a collision. Since vessel structures can vary, the final tally will utilize the percentage measure of balloons burst to compute the number of collisions.

The scoring will be done on the basis of a timer which will run throughout the course of the event, and the measure of collisions. However, in case of a technical fault, a technical time out of 5 minutes will be provided to the team to rectify the error. If the team is successfully able to correct the fault, they will be allowed to continue without any penalty. However, if they exceed this timeout limit, the timer will be allowed to run, and this time will be added to their final count.

Based on the individual points, the bottom 30% of teams will be eliminated. The remaining teams will proceed to the next round. In the case of a tie, the team with the lower percentage of burst balloons will move on. All teams ~~are~~ required to complete this event within 7 minutes (subject to the number of participating teams).

In **round 2**, two teams will face off against each other across a series of obstacles. The competing vessels will get the same amount of time to traverse across the maze and complete a series of tasks, each with its own points. Once a team crosses the maze, they will be able to access a bonus round. The first team to reach the extra level will be awarded with a bonus. All teams that reach the bonus level will compete on the same task, and the final score will be calculated on the basis of this. This will be a knockout format, where the bottom two teams compete against each other and are awarded points on the final leaderboard based on this.

In this round, the vessels are allowed to make contact with the maze walls, however, they must follow the prescribed path and not damage the maze setup. This round comprises an additional task in the maze, which will have to be successfully completed to exit the maze and progress to the bonus level. Teams will have to grab an object (using clamps, rack-pinion mechanism etc.) and then carry it throughout the maze till the end. If the object is dropped during the competition, the team will have to again retrieve it and continue. The clock will not be stopped in case the object is dropped.

The bonus level is open to any team that is able to successfully exit the maze, irrespective of the order that they reach it. However, the first team to reach the exit in a knockout round will be awarded bonus points. This level consists of bursting balloons located at various positions beyond the maze, with each balloon having a certain set of points fixed to it. The vessel must be equipped with a pin at the fore, that will be used to pop balloons. The team that accumulates the maximum number of points will be awarded a place on the leaderboard. The time limit for this round is 10 minutes (subject to the number of participating teams).

TEAM AND BOAT RESTRICTIONS

All boats competing in this event must have dimensions of 50 x 30 x 30 (in cms), within a range of 5%. Any thermocol or foam components on the vessel must be covered with a protective layer so that it does not pollute the water. Any fluid containers must be checked for leaks and electric components must be sealed with insulating material to prevent untowardly

untowardly incidents. The vessel can be either wired or wireless, but must not be automated.

In addition, in round 2, the vessel will have to pick up a thermocol object from a height of 15 cm above the water level. Teams are required to grab the object and hooking mechanisms will not be provided to the participating teams.

The maximum number of members in each team is four. A list of team members must be presented before the commencement of the event, and a representative must be present to verify the results after the event. The decision of the judges is final and binding on the team.

SCORING

The point tally for the two rounds are as follows:

Round 1 points = (percentage of balloons intact) \times (time taken by the team/time of the fastest team)

Any violations not covered in this manual will invite a 10 % penalty on the final points.

For round 2,

Round 2 points = (100 points for successfully moving the object out of the maze) - (Number of times object dropped \times 5) + (Number of balloons burst \times 5 points)

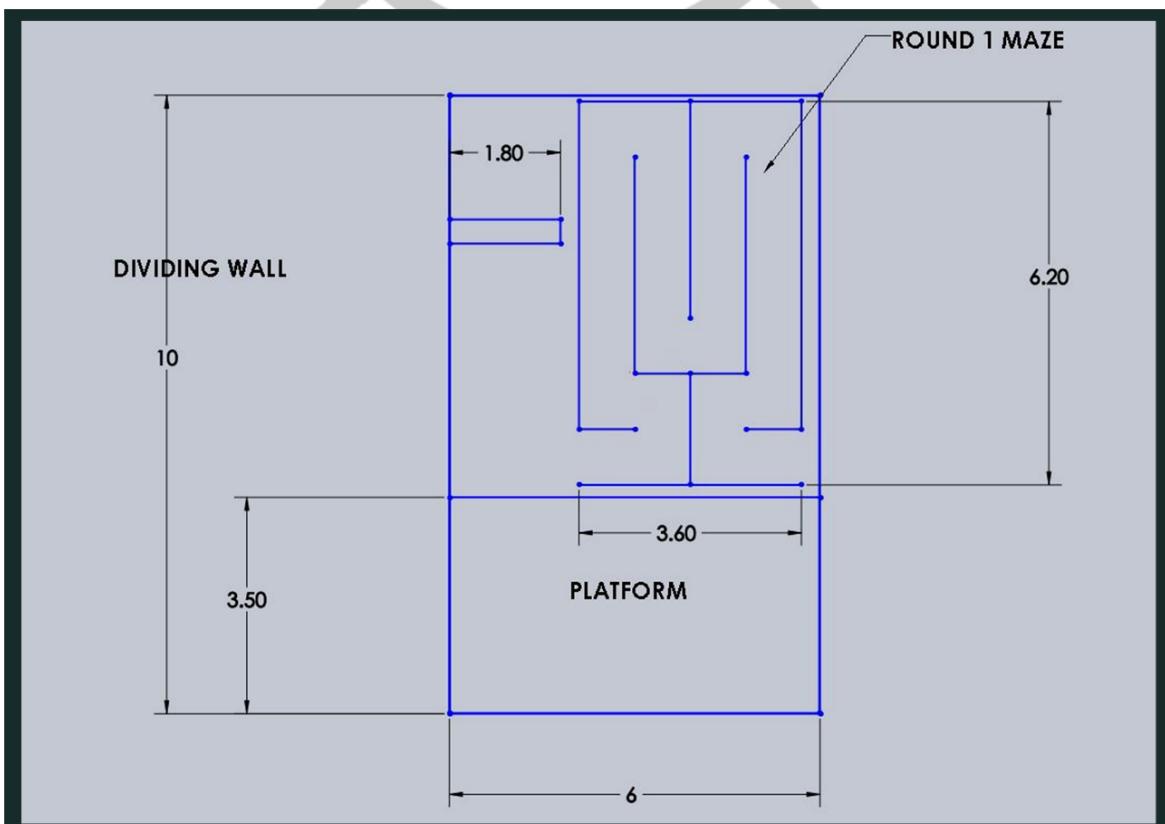
The first team to reach the bonus level will be awarded an extra 20 points, which will be added to their overall score. The final leaderboard will have the combined scores of teams obtained after completing both round 1 and round 2.

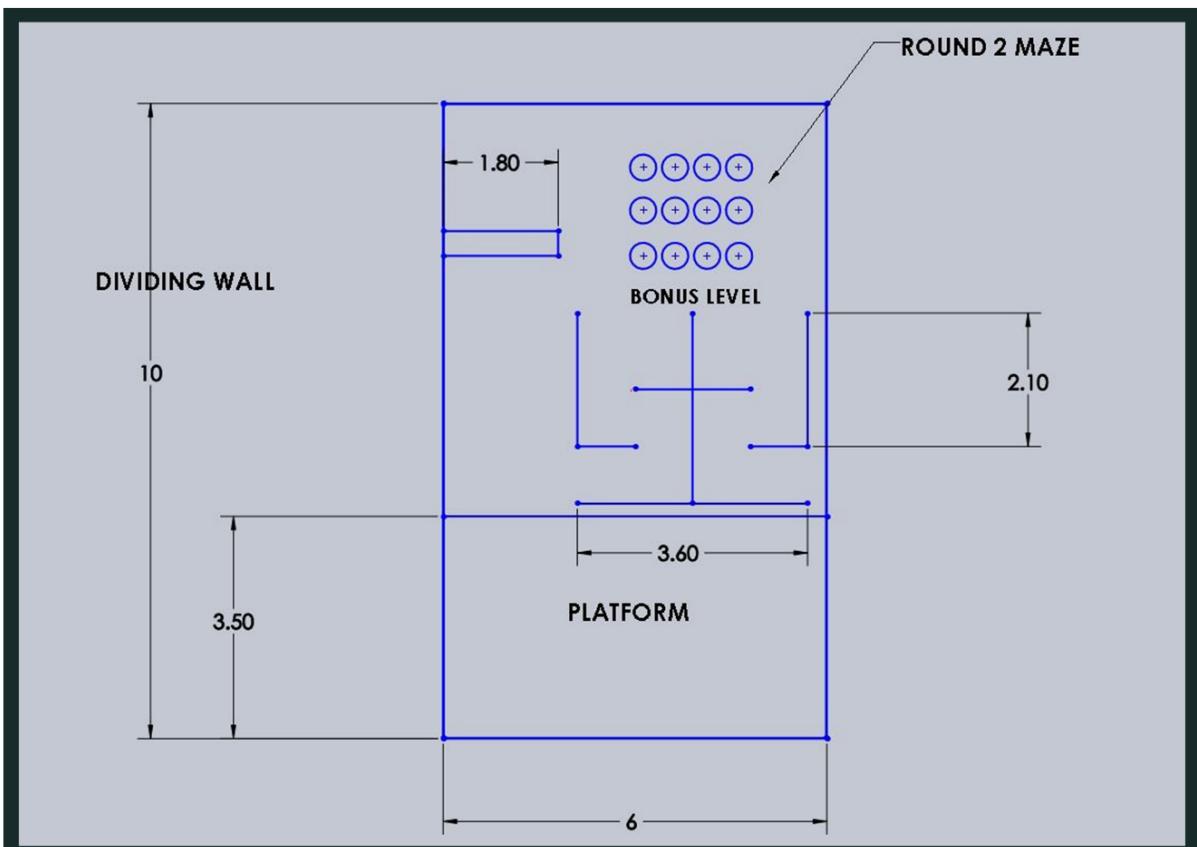
MAZE CONSTRUCTION

The maze will be constructed from walls of foam covered with protective material and covered with needles at regular intervals of 5 cm to serve as the collision detection mechanism. In addition, at the four corners of the maze, stools will be placed to support the entire maze. Colored ribbons running along the length of the maze will indicate the path to be followed. To create a gap for the wire of the vessels to pass, a gap of 3-4 cm will be left between the foam and the surface of the water. The event can also be videotaped if required.

The overall dimensions of the pool and the maze boundaries are as follows:

Diagrammatic representation of the maze setup is as shown below:





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