

ARC 7

ASWAN ROBOTICS COMPETITION

LINE FOLLOWER WAITER ROBOT

BOOK OF RULES



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ABOUT APEL TEAM

Aswan Practical Engineering Lab (APEL) is a student activity at Aswan faculty of engineering that aims to spread knowledge in different fields of science and technology in Upper Egypt. One of our main goals is improving the student's level in electronics, programming and robotics; thus, we organize a robotics competition (ARC) every year to increase the interaction between the Theoretical and the practical science.

ARC 7 (PHASE 1) THEME

Welcome to ARC 7 (Aswan robotics competition) and this year's game is line follower waiter robot. Robots will carry orders and move along a specific track to deliver them to the required place.



QUICK GUIDE

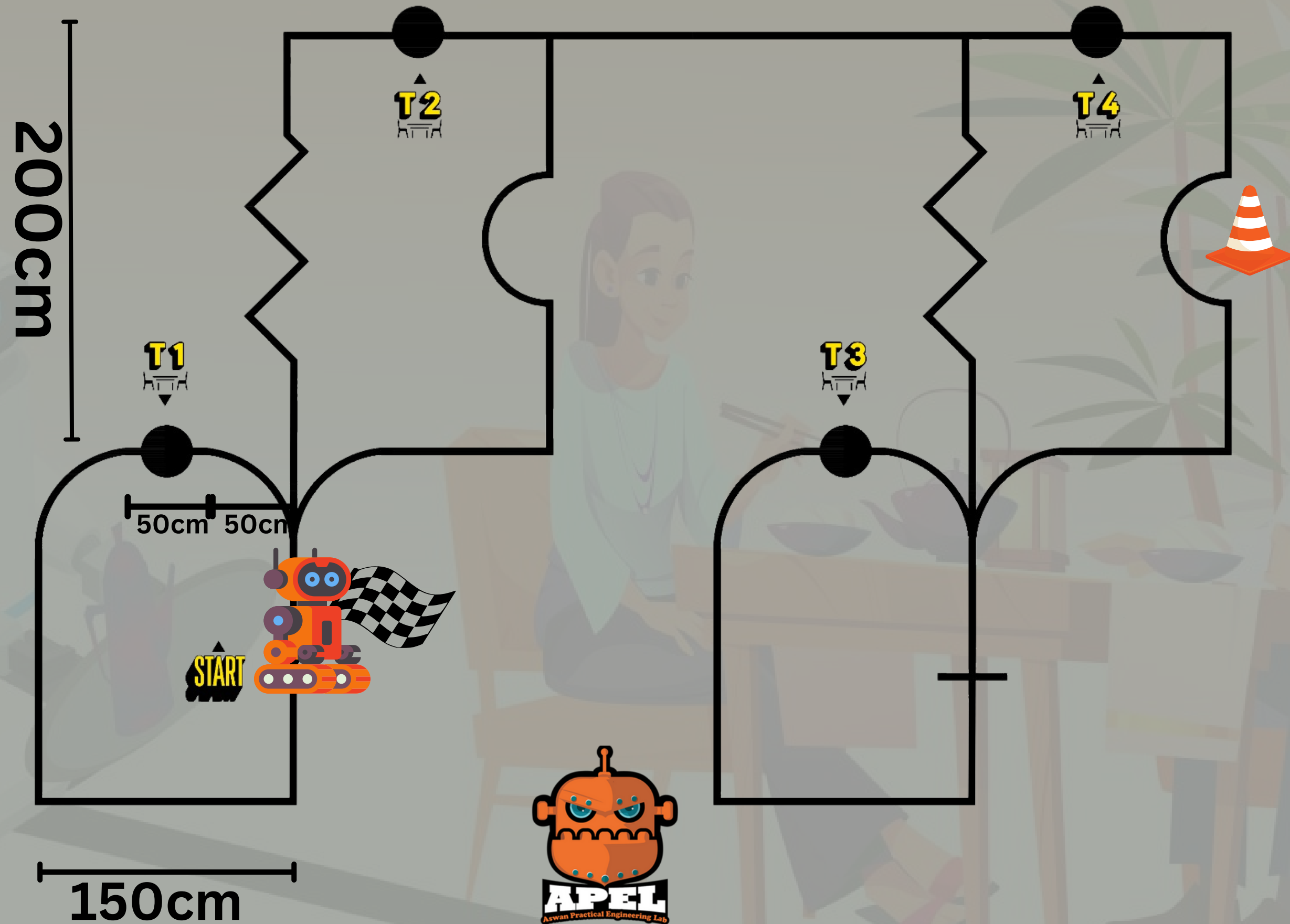
There will be 2 Tracks. Each Track has one Robot carrying the orders which it has to deliver in a maximum time of 10 minutes.

THE RESTAURANT TRACK

The Restaurant Track will be a line follower track for a restaurant with tables. Each team will be asked to build one line follower robot for the given track to deliver orders to the required table and come back to the starting point. The less time you take with a more amount of the order delivered, the higher score you gain.

RESTAURANT TRACK

TABLES AND GUIDES



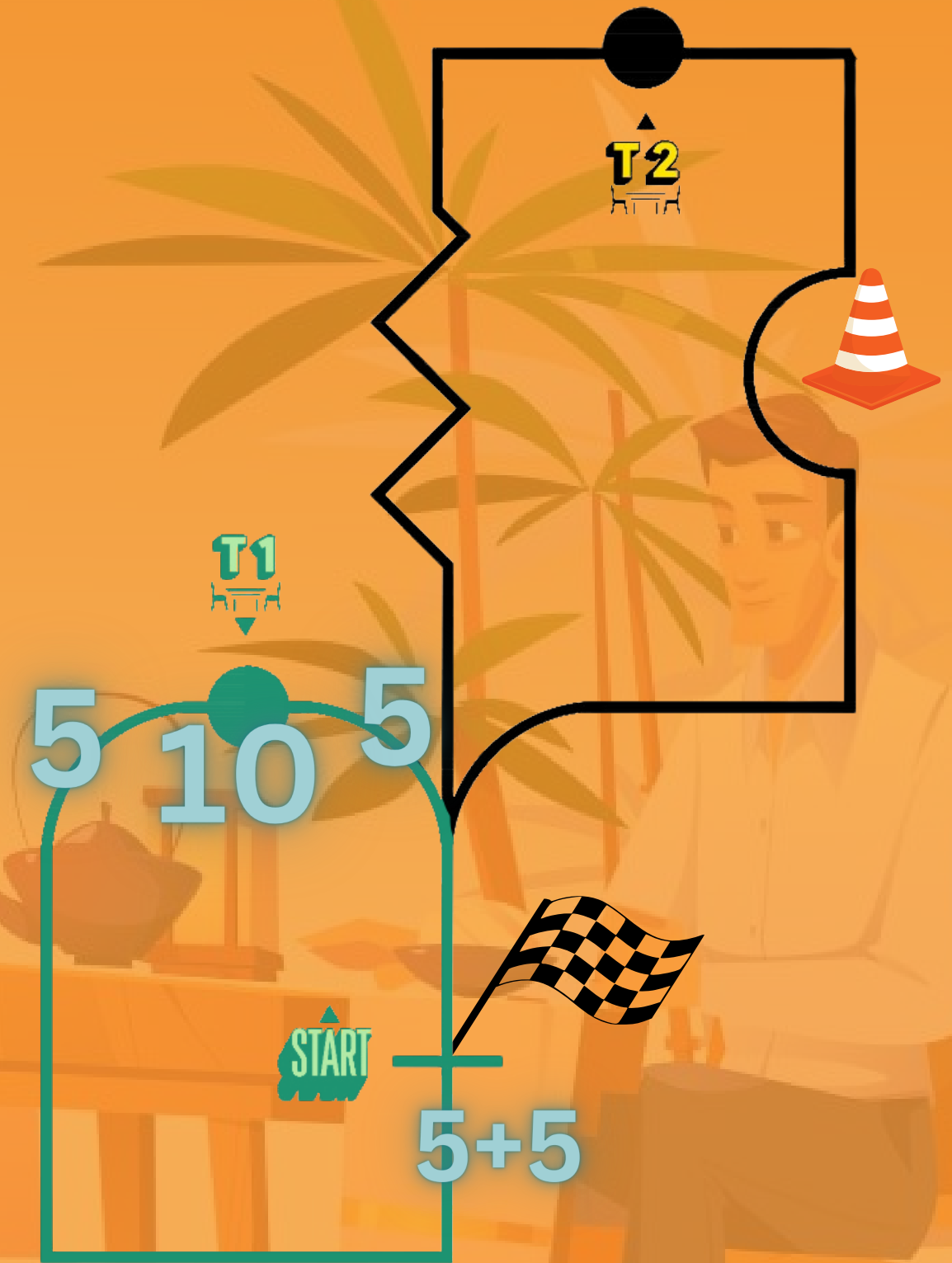
PATH 1

Method of Grade Calculation

- Start point [5 Marks]
- Move to the first curve [5 Marks]
- Get in the table (T1) [10 Marks]
- Move to the second curve [5 Marks]
- End point [5 Marks]
- If you deliver the the full number of ping pong balls on the dish you will get full mark [30 Marks].

Hint

- For example, If you drop half number of ping pong balls you will get [15 Marks] .
- This grade will be multiplied by Path 2 grade then divided by time .



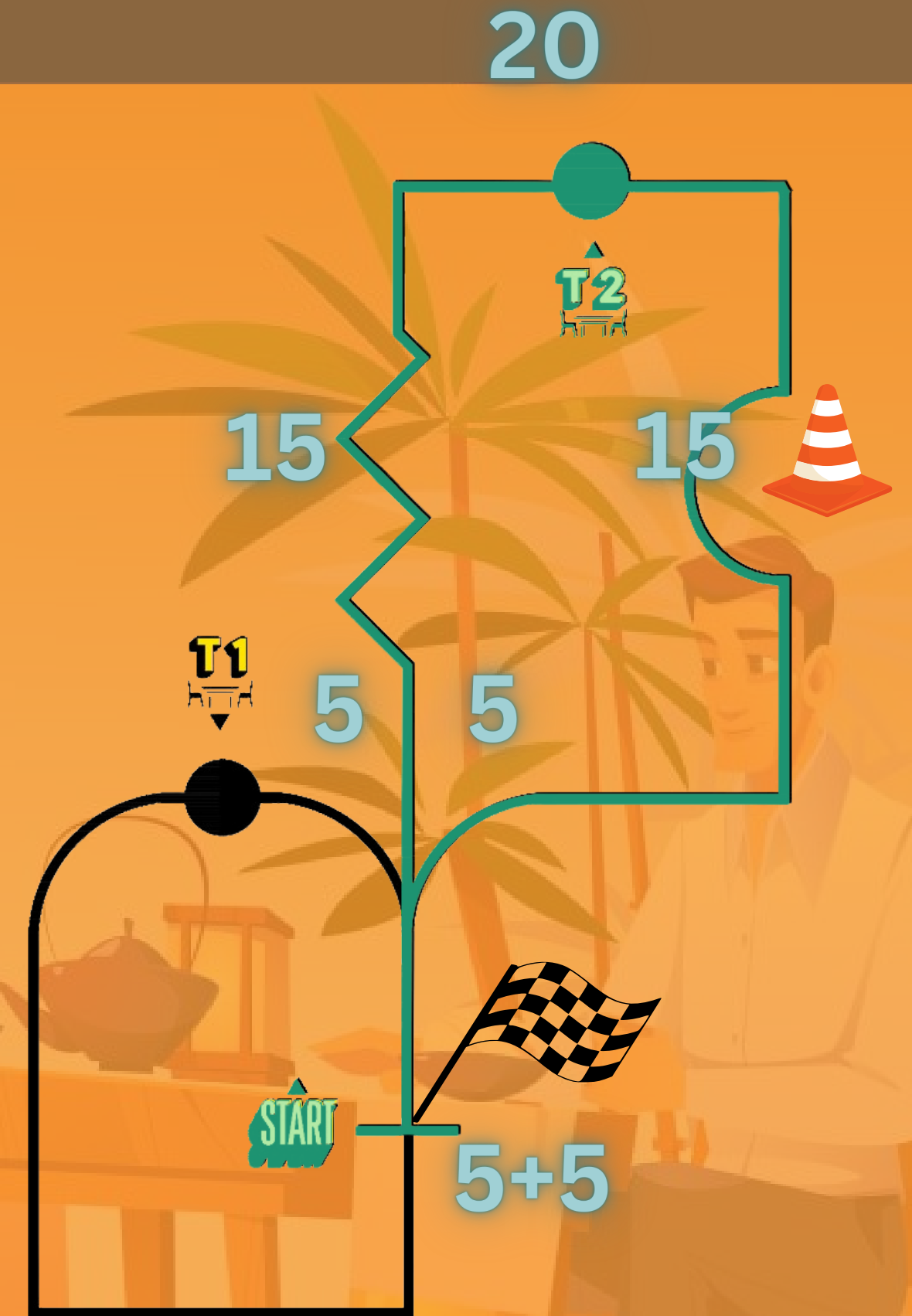
PATH 2

Method of Grade Calculation

- Start Point [5 Marks]
 - Move to the straight line [5 Marks]
 - Go through left Zigzag [15 Marks]
 - Get in the table (T2) [20 Marks]
 - Go through right Obstacle [15 Marks]
 - Move to the curve [5 Marks]
 - End Point [5 Marks]
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- If you deliver the full number of ping pong balls on the dish you will get full mark (70 Marks)

Important Note

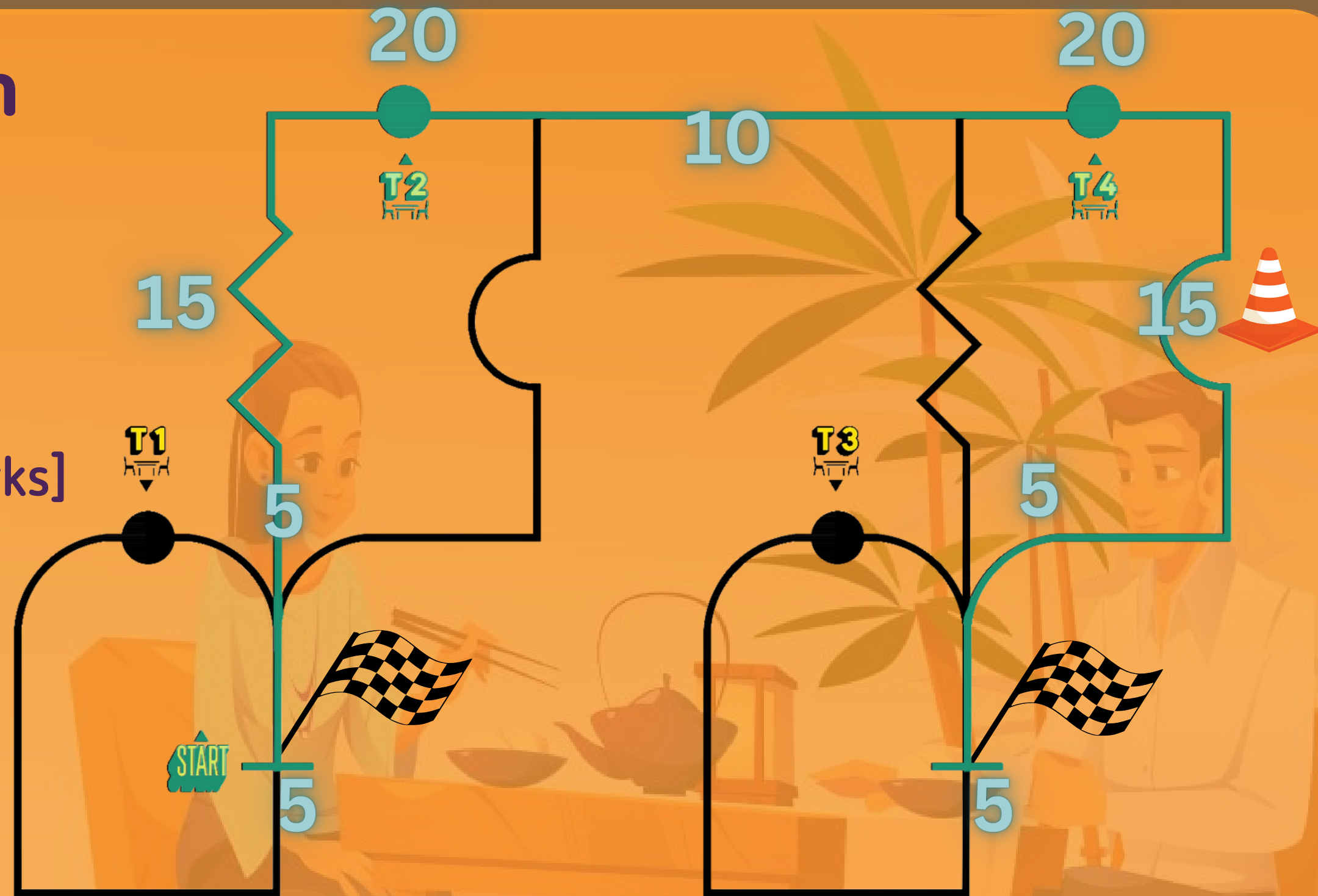
- This PATH also has the same hints of PATH 1



FINALS PATH (THE 2 TRACKS JOINED TOGETHER)

Method of Grade Calculation

- Start Point [5 Marks]
 - Move to the straight line [5 Marks]
 - Go through left Zigzag [15 Marks]
 - Get in the table (T2) [20 Marks]
 - Go through the connecting line [10 Marks]
 - Get in the table (T4) [20 Marks]
 - Go through right Obstacle [15 Marks]
 - Move to the curve [5 Marks]
 - End Point [5 Marks]
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- If you deliver the full number of ping pong balls on the dish you will get full mark [100 Marks]



INSTRUCTIONS

In Pre-finals:-

There will be 2 tracks and 2 robots will enter each of them at the same time. Each Track has 2 paths (1 and 2) so the robot has to take an order from the start point to T1 and go back to the starting point to take another order to T2, then go back to the starting point. The robot carries a dish of Ping Pong balls and should deliver these balls with least losses.

The loss in Ping Pong balls means loss in grades

In finals :-

The 2 Tracks will be Joined together. The robot should follow the path in the past page, take the two orders at the same time and deliver them for T2 and T4 respectively.



Some General Rules

- It's not allowed to control the robot through wires or applications, Only automatic control is allowed
- The designs of the robot and the code must be sent to APEL before 48 hours of the competition.
- You're not allowed to touch the robot at any part of the game
- The Robot Design must contain 3 Buttons to be used by the organizers, B1 for path 1, B2 for path 2, and B3 for finals path.
- The Robot Design must keep an area of $25*15\text{ cm}^2$ for the plastic dish to be glued above the robot.

- The Robot has to wait 10 seconds beside the tables so that the organizers take the orders then continues its journey.
- The line thickness of the track is 2.7cm

Some Details

- The Used Equation For Full Grade

$$\frac{\text{Path 1 grade}(30) \times \text{Path 2 grade}(70)}{\text{Time}}$$

- The order will be like a plastic dish of ping pong balls.

