ROBO TRACER

Advance Category

RULES & REGULATIONS

(V2)

PETROSAINS RBTX CHALLENGE 2022

Version Updates
V2 : Updated Part 4. Grand Final Brief – 5.Scoring – 5.4

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PART 1

GENERAL BRIEF

1 The Challenge

This category is open to contestants aged 13 to 17 years old only.

The challenge is to program a robot that can move around the competition field by following the track lines and completing a specific mission. **The mission is to shift all cubes one by one from one Tower Zone to another, without violating the sequence of arrangement (Tower of Hanoi).** The robot with the fastest completion time will be declared as the winner.

There are no restrictions on the type or brand of robot to be used. The robot can be custom made and built from scratch or bought off the shelves, as long as it complies with the stipulated rules and regulations. Teams must bear the cost or expenses of their own robots.

There will be an additional challenge included during the grand final stage.

1.1 General Rules

1.1.1 Phases of Competition

The competition is divided into **THREE (3)** phases as per the following:

i. Registration and Video Submission Phase (refer **Part 2 - Video Submission Brief**)
ii. Virtual Qualification Phase (refer **Part 3 - Virtual Qualification Brief**)
iii. Physical Grand Finals Phase (refer **Part 4 - Grand Finals Brief**)

Please refer to guidelines for video submission, virtual Qualifications & Grand Finals in Part 2, Part 3 and Part 4 accordingly.

Teams are required to submit a video of their completed challenge upon registration.

Based on their video submissions, selected teams will compete in the virtual **Qualification Phase** for a place in the Grand Finals.

The **Grand Finals** will be held as a physical event whereby finalists will compete for the coveted title of Petrosains RBTX Challenge 2022 Robo Tracer Advance Champion.

1.1.2 Rounds (Qualification Stage and Grand Final)

Every team will have one (1) competition run of not more than **three (3) minutes.**

The location of all the three towers are interchangeable and will be revealed prior to the competition run.

1.1.3 Mission Time

The time taken for the robot to complete the mission will be recorded as the **Mission Time.**

A timer will begin when the robot leaves the **Start Zone.** The timer will stop as the robot return to the start zone after completing the mission.

1.2 PARTICIPANTS

1.2.1 All team members except for the guardian must be between **13 to 17 years of age**. (Maximum of two (2) team members)

1.2.2 The guardian can be a teacher, parent, mentor, or technical advisor.

1.2.3 The guardian is not allowed to touch or repair the robot during all **THREE (3)** phases of the competition (refer to 1.1.1 – i to iii)

1.2.4 The guardian should not be involved in the programming of the robot during all phases of the competition (refer to 1.1)

1.2.5 In the case of any interference by the guardian with the robot or referee decisions during any phases of the competition, the team will risk disqualification.

2 Competition Field and Mission Items

2.1 Field specifications

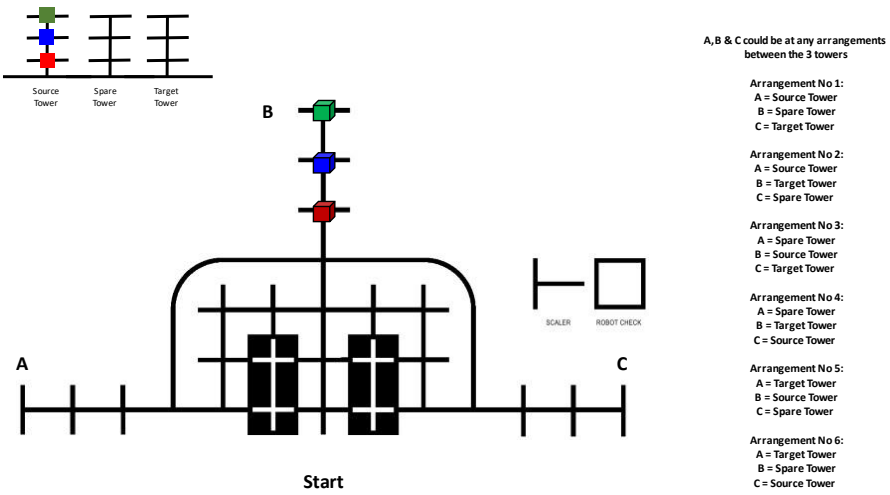
2.1.1 The track for the game will consist of 6 x 4 grid lines with 180mm spacing in between. The grid will include black lines (on white tiles). There will also be a section of junction lines on the Tower Zone.

2.1.2 All the grid lines on the competition field are 20mm in width and are white or black in colour.

2.1.3 Expect all measurements and dimensions to have a 10% tolerance.

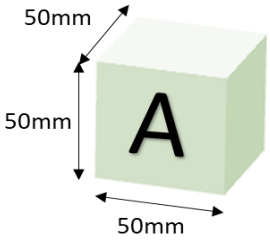
2.1.4 There will be a **Start Zone** and three (3) **Tower Zones** (Source Tower, Spare Tower, and Target Tower).

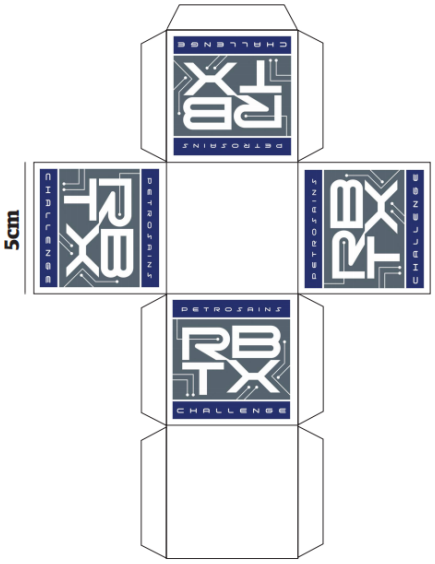
2.1.5 The layout of the competition field is as below:



Disclaimer: The track is fixed but the location of the towers and mission items are subject to change. Arrangement No 2 shall be the towers position for <u>Video submission phase</u>. However, the positions of the towers may be changed for Virtual Qualification.

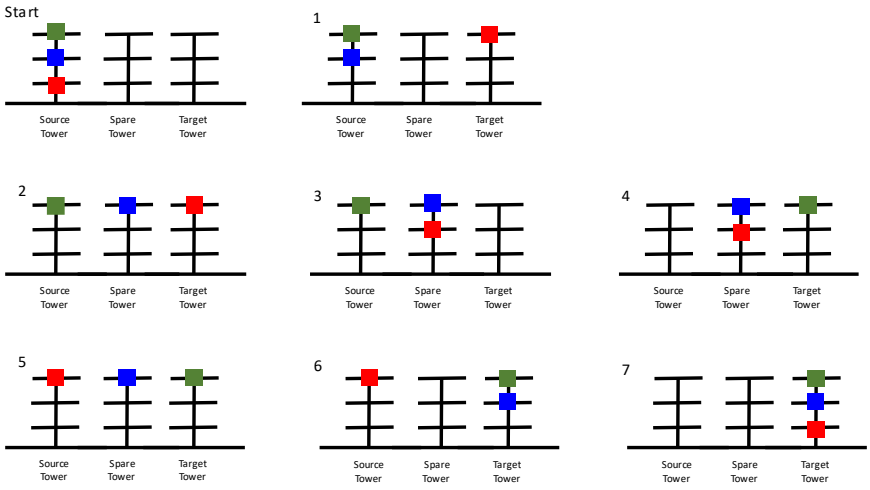
2.1.6 The **Mission Items** are identified as **Red, Blue and Green coloured cubes** with the size of 50mm x 50mm x 50mm (Width x Length x Height) as follows:





*To be printed on A4 (350- 400gm) coloured paper accordingly – **red, green, blue**

2.1.7 The team's mission is to shift the cubes **one by one** from the Source Tower, to the Target Tower via the Spare Tower or vice versa, and without violating the sequence of arrangement (Tower of Hanoi) as follows.



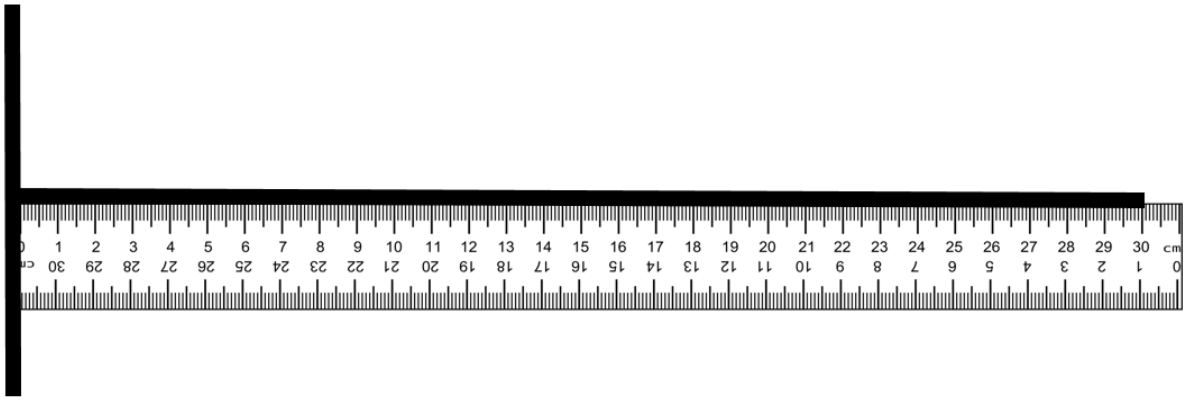
2.1.8 If the rule of the Tower of Hanoi is violated, the team must restart the mission with their point tally reset to zero.

3 The Robots

3.1 Verification

3.1.1 Start the video with a full view of the entire competition field.

3.1.2 **Track Scale Check** – Zoom the video to the scale checker to verify the track measurements. Place a standard 30cm stationary ruler on the track beside the scale checker.



3.1.3 **Robot Size Check** – Place the robot inside the robot size checker on the track. Teams must ensure to show that the robot can fit within the outline of the robot size checker.

3.1.4 **Robot Features Check** – Teams must include shots of their robot's features as per the competition requirements.

3.2 Moving the MISSION ITEM

3.2.1 There are no restrictions on how the robots can move the mission items, as long as it does not cause damage to competition field or the mission item.

3.2.2 The robots may push, carry, lift or drag to move the mission item.

3.2.3 The robots may be equipped with claws, grippers, scoops, pushers and so forth to move the mission items.

3.2.4 The robots can only carry one mission item from one tower to another.

3.2.5 If the mission **item falls, are wrongly placed on the track, or did not follow the Tower of Hanoi rule**, the robot handlers may request for a **Restart** (4.3).

3.3 Dimensions

Every robot must comply to the following robot size specifications (when all parts and accessories are fully extended):

Width – 200mm max.

Length – 200mm max.

3.4 Control and Programming

3.4.1 The robot must move autonomously with no human aid.

3.4.2 The controller unit should be embedded in the robot and cannot be placed on the robot's exterior.

3.4.3 The robot must be programmed by the team members (either text based or GUI programming) and uploaded during the Construction and Programming phase

3.5 Power Source

3.5.1 The robot must be powered by a power source such as a battery fixed on to the robot.

3.5.2 The robot cannot be powered by a stationary power source connected to the robot by a cord.

3.6 Construction

Any robot kit or building material may be used, as long as the robot fits the specifications. The team may risk disqualification if the robot or any of its part cause damage or deface the competition field.

4 Game Play

4.1 Game Zone

An area around the field will be designated as the **Game Zone**. No one is allowed inside the game zone except for the robot handlers (two team members).

4.2 Scoring

4.2.1 Points are given when mission items are correctly placed at the Target Tower.

Cube colour

Green = 3 points

Blue = 2 points

Red = 1 point

4.2.2 The final score will be the total points accumulated based on the number of cubes at the target tower

4.2.3 The **Mission Time** is the time recorded for the robot to complete tracing the route from the Start Zone until it **completes the mission and return to the Start Zone.**

4.2.4 The mission time is started once the robot starts to move.

4.2.5 The final mission time is concluded as and when any part of the robot returns to the start zone.

4.2.6 The team with the **highest points will be ranked first**. If there are two teams or more with the same accumulated points, the team with the fastest mission time will be ranked higher.

4.3 Restart

4.3.1 The robots and the mission items will be placed at the start zone and source tower.

4.3.2 The robot handlers may request for a restart whenever it is deemed necessary within the three minutes time limit. During the restart process, the handlers are allowed to make minor adjustments to the robots but not in terms of programming or replacing parts.

4.3.3 When restarting, all robots and mission must be placed back inside the start zone accordingly.

4.3.4 The mission time will be reset to zero.

4.3.5 There is no limit for the number of restarts within the three minutes time limit.

4.3.6 It is **compulsory** for the robots to restart if:

- The robot handler asks for a restart.
- The robot handler touches any parts of the robots.
- The robot moves off the field.
- The mission items fall or is wrongly placed on the track.
- The Tower of Hanoi rule is in any way violated.

5 Deciding the Winner

The winner will be decided based on the following criteria:

1. Highest score
2. The team with the fastest mission time.
3. As per the judges' decision.

6 Code of Conduct

6.1 Fair Play

6.1.1 It is expected that the aim of all teams is to play a fair and clean game.

6.1.2 The rules are enforced at the discretion of the referees, officials, and local law enforcement authorities.

6.1.3 Participating teams and robots that do not meet the regulations and specifications are not allowed to compete in the competition.

6.1.4 Participating teams that violate the code of conduct may be asked to leave the competition and risk disqualification.

7 Judges

7.1 All decisions on scoring, gameplay and timing are made by the judges. Teams should completely respect their vote and decisions.

7.2 Judges may announce new rules or decisions pertaining to any issues that might not be mentioned in the existing rules and regulations, which must be abided by all participants.

PART 2

VIDEO SUBMISSION BRIEF

1 The Challenge

The challenge is to program a robot that can move around the competition field by following the track lines and completing a specific mission. **The mission is to shift all cubes one by one from one Tower Zone to another, without violating the sequence of arrangement (Tower of Hanoi).** The robot with the fastest completion time will be declared as the winner.

Participating teams are required to record **a Video** of their robot completing the challenge in the fastest time and by collecting the most points.

The following are the requirements for the video file:

i. Teams must provide a link to the video (which can be uploaded to any platform such as Google Drive, YouTube etc). The link must be listed and accessible for the organizer to view.
ii. The duration of the video must not exceed 10 minutes.
iii. All final audio/video presentations must be in MP4 Format (H.264 video and AAC audio codec).
iv. Video size set at HD (1280 x 720 or other '720p' setting)
v. The audio/video dimensions must have a minimum height of 480 pixels with an aspect ratio of 16:9.
vi. The naming convention for the video must include the team's name for judges' reference purposes.

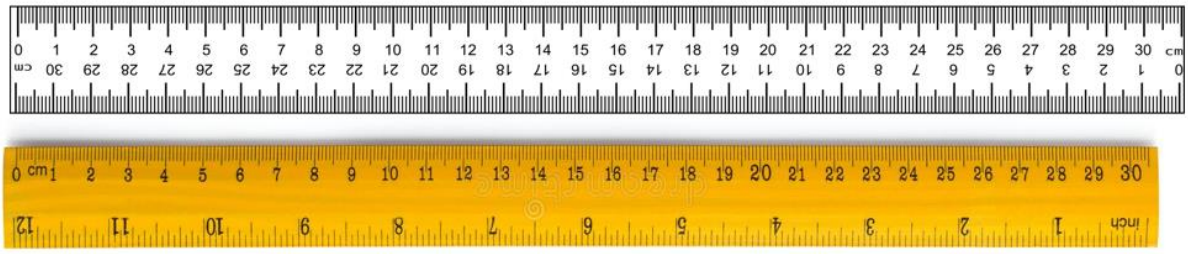
All the requirements stated are to be adhered to.

2 Game Play

2.1 Verification

2.1.1 Start the video with a full view of the entire competition field.

2.1.2 **Track Scale Check** – Zoom the video to the scale checker to verify the track measurements. Place a standard 30cm stationary ruler on the track beside the scale checker.



2.1.3 **Robot Size Check** – Place the robot inside the robot size checker on the track. Teams must ensure to show that the robot can fit within the outline of the robot size checker.

2.1.4 **Robot Features Check** – Teams must include shots of their robot's features as per the competition requirements.

2.2 Competition Video Display Setup

2.2.1 The full competition field must be in full view throughout the video.

2.2.2 Place any form of a stopwatch timer that is **visible** at the bottom right-hand corner of the video.

2.2.3 Any editing or manipulation of the video timing will cause immediate disqualification.

2.3 Competition Start

2.3.1 The video must consistently capture the robot's movement and the entirety of the competition field throughout the recorded run.

2.3.2 Participants may first implement any calibration procedures.

2.3.3 The handler must place the robot at the start zone.

2.3.4 After pressing the start button, the robot should then begin to complete the mission in the fastest time.

2.3.5 Simultaneously with 2.3.4, a team member shall start the stopwatch timer that is visible in the video.

2.4 Following the line

2.4.1 For the purpose of determining if the robot has moved outside the line or strayed off the field, the competition will use the **CONVEX HULL** of the robot. This measure is done by stretching an imaginary rubber band around the extremities of the robot and using the enclosed space as a silhouette.

2.4.2 The robot must remain on the field until the game has been completed.

2.5 Competition Finish

2.5.1 As the robot returns to the start zone after completing the mission, the timer will stop, and the time taken to complete the mission will recorded as the mission time.

2.5.2 A team member must also stop the timer on the stopwatch at the same time as 2.5.1.

2.5.3 Show the final reading of the stopwatch timer clearly in the video recording.

3 Minimum Requirements

The robot must complete the task within a maximum time limit of three(3) minutes.

4 Code of Conduct

4.1 It is expected that the aim of all teams is to play a fair and clean game.

4.2 The rules will be enforced at the discretion of the referees, officials, and local law enforcement authorities.

5 Judges

5.1 All decisions on scoring, gameplay and timing are made by the judges. Teams should completely respect their vote and decisions.

5.2 Judges may announce new rules or decisions pertaining to any issues that might not be mentioned in the existing rules and regulations, which must be abided by all participants.

5.3 All decisions are final.

PART 3

VIRTUAL
QUALIFICATION BRIEF

1 The Challenge

The challenge is to program a robot that can move around the competition field by following the track lines and completing a specific mission. **The mission is to shift all cubes one by one from one Tower Zone to another, without violating the sequence of arrangement (Tower of Hanoi).** The robot with the fastest completion time will be declared as the winner.

Based on their video submissions, the top ranked teams will be selected to move on to the Virtual Qualification Phase and subsequently the Grand Finals. The qualified teams shall be notified in advance for their game schedule. All qualified teams are required to compete via **live video streaming** on a **virtual competition platform**. Teams will be at their own location with their own printed track and robot.

2 Game Play

2.1 Virtual Competition Overview

2.1.1 The participating team will be given access to the virtual competition platform at a designated time. This will be informed to the team at least 24 hours before the competition run.

2.1.2 The competition run will be conducted online with referees remotely evaluating the race and run time and adherence to all competition rules and regulations.

2.1.3 The competition includes a minimum of ONE (1) referee and the participating team.

2.1.4 Participating teams may be required to record the live video streaming for backup purposes.

2.1.5 A compulsory briefing session will be conducted before the start of the competition run for all participating teams.

2.1.6 Each participating team shall have **one (1)** competition run.

2.1.7 The competition run should not last more than three (3) minutes (labelled as **Runtime**).

2.1.8 If the robot has yet to complete the run despite exceeding the three minute runtime, the online referee in attendance will ask the team to stop.

2.1.9 Race clock

When the robot passes the start zone, a visible stopwatch timer will be started by a team member to begin the count for the mission time.

As the robot completes the mission and returns to the start zone, the stopwatch timer will be stopped, and the final recorded mission time will be saved.

2.1.10 The live video streaming session of the Virtual Competition will be conducted as per the following:

i. Verification (Track & Robot)

ii. Competition Run

2.1.11 The competition field must be in full view throughout the live video streaming session.

2.1.12 Teams must place any form of a stopwatch timer that is visible at the bottom right-hand corner of their screen.

2.1.13 Any editing or manipulation of the timing will cause immediate disqualification.

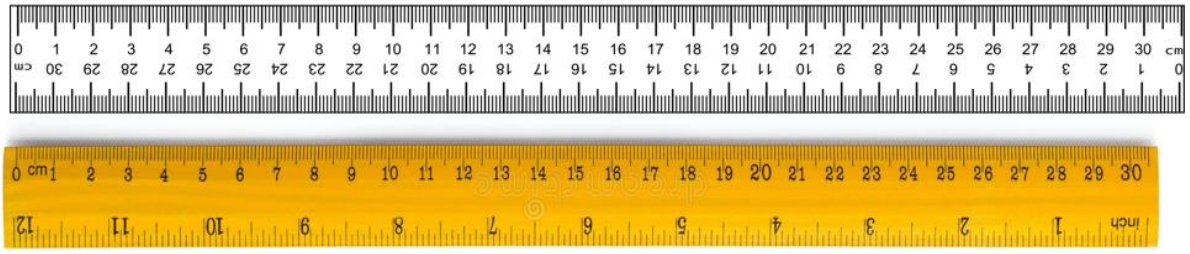
2.1.14 Participating teams shall ensure and are responsible for a stable internet connection throughout their competition run.

2.1.15 In the event that a participating team has a technical problem during their competition run, the referee, at their sole discretion, will decide if the run must be cancelled or restarted.

2.2 Verification

Prior to the start of the game, participating teams must first verify their competition field measurements, robot size and robot features. This will include testing the visual stopwatch timer and the robot's onboard display timer capabilities.

2.2.1 **Track Scale Check** – Verification of the competition field measurement is done by placing a standard 30cm stationary ruler on the track beside the scale checker.



2.2.2 **Robot Size Check** - The robot size check is done by placing the robot inside the robot size checker. The robot must fit within the outline of the robot size checker.

2.2.3 **Robot Features Check** – Display and show the robot features as per the competition requirements.

2.3 Competition Run

2.3.1 Teams must consistently capture their robot's movement and the entirety of the competition field throughout the virtual competition run.

2.3.2 Participants may first implement any calibration procedures.

2.3.3 The handler must place the robot at the start zone.

2.3.4 After pressing the start button, the robot should then begin to trace the line and complete the mission in the fastest time.

2.3.5 Simultaneously with 2.3.4, a team member shall start the stopwatch timer that is visible on the screen.

2.3.6 Teams may restart their run if deemed necessary, within the three-minute runtime.

The restart can be requested only if the robot does not follow the line, has stopped halfway, or has lost direction.

2.3.7 At any restart, the robot must be positioned back at the start zone.

2.3.8 Adjusting the sensor position on the robot is allowed during the allocated runtime.

2.3.9 The mission time will be reset to zero at every restart. However, the runtime will keep running during all restarts.

2.3.10 There is no limit for the number of restarts within the runtime of three minutes.

2.3.11 A robot must restart if:

- The robot handler asks for a restart.
- The robot is touched by a contestant.
- The robot moves off the field.

2.4 Following the line

2.4.1 For the purpose of determining if the robot has moved outside the line or strayed off the field, the competition will use the **CONVEX HULL** of the robot. This measure is done by stretching an imaginary rubber band around the extremities of the robot and using the enclosed space as a silhouette.

2.4.2 The robot must remain on the field until the game has been completed.

2.5 Competition Finish

2.5.1 The competition is complete as and when the robot returns to the start zone after completing the mission. The timer will stop, and the time taken to complete the mission will recorded as the mission time.

2.5.2 A team member shall also stop the timer on the stopwatch at the same time as 2.5.1.

2.5.3 Show the final reading of the stopwatch timer clearly on the screen.

3 Code of Conduct

3.1 It is expected that the aim of all teams is to play a fair and clean game.

3.2 Participating teams that violate the code of conduct may risk being disqualified from the competition.

3.3 The rules will be enforced at the discretion of the referees, officials, and local law enforcement authorities.

4 Judges

4.1 All decisions on scoring, gameplay and timing are made by the judges. Teams should completely respect their vote and decisions.

4.2 Judges may announce new rules or decisions pertaining to any issues that might not be mentioned in the existing rules and regulations, which must be abided by all participants.

4.3 All decisions are final.

PART 4

GRAND FINALS BRIEF

1 The Challenge

The challenge is to program a robot that can move around the competition field by following the track lines and completing a specific mission. **The mission is to shift all cubes one by one from one Tower Zone to another, without violating the sequence of arrangement (Tower of Hanoi) while avoiding obstacles.** The robot with the fastest completion time will be declared as the winner.

1.1 General Rules

1.1.1 Phases of Competition

The competition is divided into three phases as per the following:

i. Construction and Programming
ii. Quarantine
iii. Competition Run

The minimum Construction and Programming time is ONE hour. It can be extended depending on track complexity and subjected to committee discretion.

Upon the completion of Construction and Programming during the allocated time, all robots will be placed in the Quarantine area by the contestants. No addition, removal, changes of hardware or software is allowed during this period.

In the Competition Run, contestants will take their robots from the Quarantine Area and place it on the track.

1.1.2 Rounds

Every team will have two competition runs.

Each competition run will have its own Construction and Programming and Quarantine phases.

One round should not last more than three minutes (labelled as RUNTIME).

If a robot has yet to reach the finish line once the RUNTIME is over, a BUZZER will go off and the team will be asked to remove the robot from the COMPETITION FIELD.

The position of obstacle/s will be revealed on the day of the competition and may change in between competition runs.

1.1.3 Race clock

There will be optical sensors that can detect the robot's movements.

When the robot moves from the START line and passes these optical sensors, a timer will automatically begin to count the RACETIME.

As the robot reaches the finish line, the timer will stop and the final recorded RACETIME value will be saved.

1.2 Team Members & Mentors

1.2.1 All team members except for the team mentor must be between **13 to 17 years of age**. (Maximum of two team members)

1.2.2 Only one mentor in the team is allowed as a technical advisor.

1.2.3 The technical advisor is not allowed to touch or repair the robot during the phases of the competition (refer to 1.1.1).

1.2.4 The technical advisor should not be involved in the programming of the robot during the phases of the competition (refer to 1.1.1).

1.2.5 In case of any interference by the technical advisor with the robot or referee decisions during the competition, the team will risk disqualification.

2 Competition Field

2.1 Field specifications

2.1.1 Lines to be followed are 20mm in width and are white and black in colour.

2.1.2 The obstacles are 160mm(width) x 50mm(depth) x 160mm(height).

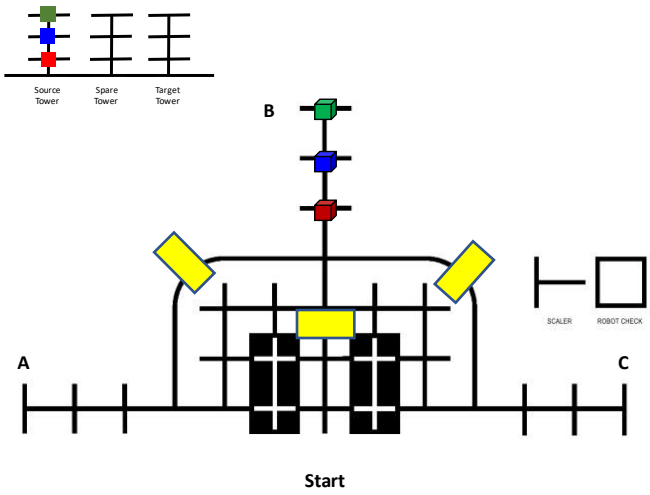
2.1.3 Expect all measurements and dimensions to have a 10% tolerance.

2.1.4 The organizing committee will make every possible attempt to ensure that there are no 'bumps' between the tiles although there may be slight deviations in height and width of up to 3mm. Contestants must be prepared to deal with these slight imperfections.

2.1.5 There will be one START line and FINISH LINE.

2.1.6 The field will include obstacle/s to test the robot's avoidance sensor.

2.1.7 The dimensions of the COMPETITION FIELD are as follows:



A,B & C could be at any arrangements between the 3 towers

Arrangement No 1:
A = Source Tower
B = Spare Tower
C = Target Tower

Arrangement No 2:
A = Source Tower
B = Target Tower
C = Spare Tower

Arrangement No 3:
A = Spare Tower
B = Source Tower
C = Target Tower

Arrangement No 4:
A = Spare Tower
B = Target Tower
C = Source Tower

Arrangement No 5:
A = Target Tower
B = Source Tower
C = Spare Tower

Arrangement No 6:
A = Target Tower
B = Spare Tower
C = Source Tower

Note: Obstacle locations will only be revealed on the day of the competition. There are 3 possible locations with minimum of two obstacles will be place.

3 The Robots

3.1 Dimensions

Each team must comply with the following robot specifications:

Width – 200mm max

Length – 200mm max

3.2 Control and Programming

3.2.1 The robot must be controlled autonomously with no human aid.

3.2.2 The controller unit should be embedded in the robot and cannot be placed on the robot's exterior.

3.2.3 The robot must be programmed by the team members (either text based or graphical programming) and uploaded during the

Construction and Programming phase. No pre-programming of the robot or switch-based coding is allowed.

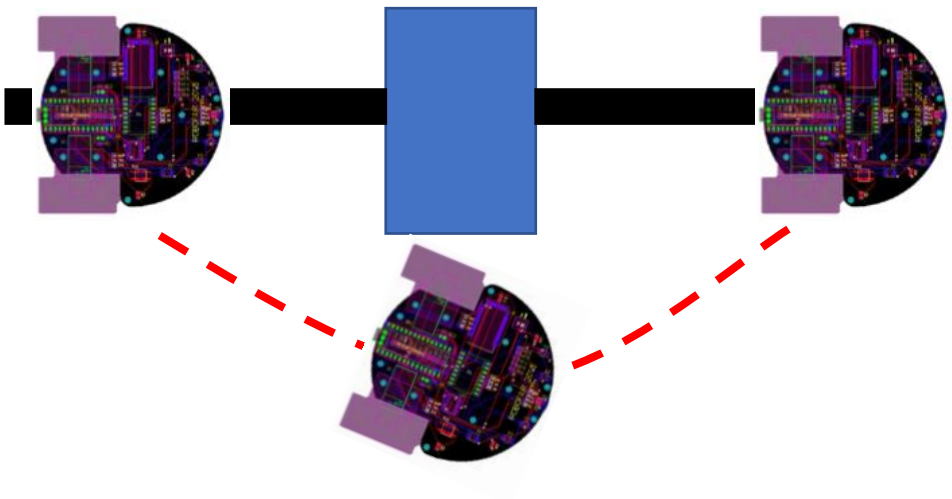
3.2.4 Any type of communication device or medium of communication is prohibited during the Construction and Programming phase. These include but are not limited to handphones, internet connection, emails, whatsapp, messengers, etc.

3.2.5 Contestants should prepare a laptop/computer for this purpose and must carry a fully charged battery in case of a power supply problem at the competition venue.

3.3 Sensors

3.3.1 Up to a maximum of five line sensors are allowed. It has to be able to detect both black on white lines and white on black lines.

3.3.2 The robot must be able to avoid obstacles placed on the line track. This can be achieved by implementing evasive maneuvering and returning to the line track as shown below:



Or avoid the path altogether.

3.3.3 The robot is allowed to leave the line in this instance but has to find the line within a maximum time of five seconds

3.4 Power Source

3.4.1 The robot must be powered by a power source such as a battery fixed on to the robot.

3.4.2 The robot cannot be powered by a stationary power source connected to the robot by a cord.

3.5 Construction

Any robot kit or building material may be used, as long as the robot fits the above specifications.

4 Game Play

4.1 Construction Zone

An area inside the competition venue will be designated as the CONSTRUCTION ZONE. No one is allowed inside the construction zone except for the robot handlers and the referees.

4.2 Game Zone

An area around the field will be designated as the GAME ZONE. No one is allowed inside the game zone except for the robot handlers and the referees.

4.3 Start and Restarts

4.3.1 One team member is elected as the robot handler. Only that team member is permitted to handle the robot during the game.

4.3.2 The robot will be placed at the START line and checked by one of the referees.

4.3.3 A robot may restart the run as the handlers deem necessary within the RUNTIME.

The restart can be requested only if the robot doesn't follow the line, has stopped halfway or has lost the directions.

4.3.4 At any restart, the robot must be positioned back at the START line.

4.3.5 Adjusting the sensor position on the robot is allowed during the allocated RUNTIME.

4.3.6 The RACETIME will be reset to zero during every restart. The RUNTIME will keep running during all restarts.

4.3.7 There is no limit for the number of restarts within the RUNTIME of three minutes.

4.3.8 A robot must restart if:

- The robot handler ask for a restart.

- The robot is touched by a contestant.

- The robot moves off the field.

4.4 Following the line

4.4.1 For the purposes of determining if the ROBOT has left the line or left the tile, the referee will use the CONVEX HULL of the robot. This measure is done by stretching an imaginary rubber band around the extremities of the robot and using the enclosed space as a silhouette.

4.4.2 A team's robot must remain at the field until it has completed its game.

5 Scoring

5.1 Points are given when mission items are correctly placed at the Target Tower.

Cube colour

Green = 3 points

Blue = 2 points

Red = 1 point

5.2 The final score will be the total points accumulated based on the number of cubes at the target tower

5.3 The **Mission Time** is the time recorded for the robot to complete tracing the route from the Start Zone until it **completes the mission and return to the Start Zone.**

5.4 The mission time is started once the robot starts to move.

5.5 The final mission time is concluded as and when any part of the robot returns to the start zone.

5.6 The team with the **highest points will be ranked first**. If there are two teams or more with the same accumulated points, the team with the fastest mission time will be ranked higher.

6 Code of Conduct

6.1 Fair Play

6.1.1 Robots that cause deliberate interference with other robots or damage to the field will be disqualified.

6.1.2 Contestants that cause deliberate interference with robots or damage to the field will be disqualified.

6.1.3 It is expected that the aim of all teams is to play a fair and clean game.

6.2 Behaviour

6.2.1 Contestants who misbehave may be asked to leave the competition area and risk being disqualified from the contest.

6.2.2 The rules will be enforced at the discretion of the referees, officials, and local law enforcement authorities.

7 Juries

7.1 All decisions about scoring, gameplay and timing are made by the juries. Teams should completely respect their vote and decisions.

7.2 Juries may discuss and announce new rules or decisions pertaining to any issues that are not mentioned in the rules and regulations. Objections will not be entertained.

8 Standard Operating Procedure (SOP)

8.1 Scan the MySejahtera QR code when entering the premises or prior to participating in activities.

8.2 Wear a face mask at all times when in the company of others.

8.3 Maintain physical distancing of at least 1 metre from others where possible.

8.4 Adhere to COVID-19 testing requirements as per the NTS1; and

8.5 Report test results on the MySejahtera application if COVID-19 positive; and

8.6 COVID-19 positive cases shall undergo self-isolation based on MOH directions and **will not be allowed** to participate in the Grand Finals of Petrosains RBTX Challenge 2022.

8.7 Close contact Employees or Individuals shall undergo mandatory quarantine based on MOH current policies and undergo COVID-19 screening test if symptomatic.

*subject to changes by MKN

ROBO TRACER ADVANCE: SCORING CHECKLIST

Scoring Checklist		
Items	**Yes**	**No**
Verification		
Presence of appropriate timer on screen		
Printed track is according to scale and specifications		
Video Camera view angle per instruction (Refer Part 2)		
Robot Specification		
Width < 20 cm		
Length < 20 cm		
The robot meets the specification and restriction		
IR Sensors <= 5		
No wireless module (OFF MODE)		
Robot, Tower and Mission Item Placement on Track		
Robot at Start point position		
Size of Mission Item 5cm x 5cm x 5cm		
Color of the Mission Item (Green, Blue, Red)		
Position of the Mission Item on Source Tower		
Scoring		
Follow the Tower of Hanoi Rule		
Recorded Total Time (Max 3 minutes)		
Mission Item placed correctly at Target Tower		
Green (3 points)		
Blue (2 points)		
Red (1 point)		
Recorded the Best Time in Seconds (Mission Time)		
Number of restart		