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* The rules may be updated. Please check the website for the updates regularly. *

Mission Challenge	Division	Team	Building
	Junior/Senior	1~3 Member Max 2 Robots	On-Site

1. Description

Mission challenge requires the participant to build a robot to clear the mission given on the day in a limited situation without given platform creatively. Participants' scientific knowledge and problem-solving using robot technology may be evaluated.

2. Robot

2-1. Types of robot No restriction

2-2. Building robot All parts of the robot except controller must be made on site by the participant. The size of the robot must be within restricted size and soldering is available.

2-2-1. Size of the robot

2-2-1-1. Size of the robot Size restriction announced on the day with the mission

2-2-1-2. Measuring size

1) Self-measurement: Participant can measure the size during building and practicing time given.

2) Official measurement: Referee measures before competition starts.

3) Way of measurement: Measured with the robot turned on with the measurement tool. The participant is not allowed to object to referee's judgement.

4) Modification: If the size goes over the limit, the participant gets a chance to modify for a minute at the recording seat. Software modification is not allowed. If failed to modify, the trial will fail and be considered 'over size limit'.

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2-2-2. Sensor of the robot No restriction

2-2-3. Power of the robot

2-2-3-1. Composition of the power Independent movable power must be used. Combustion engine are not allowed to use.

2-2-3-2. Size of the power No restriction on current and voltage.

2-2-4. Movement of the robot No restriction

2-2-5. Motor of the robot No restriction

2-3. Programming and control Robot must be autonomously moved via program, and not be controlled by person except when starting.

2-4. Disassemble of motor horn and wheel Wheel and tire doesn't need to be disassembled and wheel and motor horn shouldn't be attached in advance.

3. **Stadium** Structure, layout and size depends on the mission, and will be announced on the day.

4. **Competition progress**

4-1. Way of competition progress Two trials of record games will be given. Time to modify the robot will be given between the trials.

4-2. Time given to build and practice Two hours in minimum will be given to build the robot and practice, and will be noticed on the day of match.

4-3. Field assignment Field is assigned based on number of participants and difficulty of the mission.

4-4. Robot building and practicing Participant can practice at the designated field before building and practicing time finishes, and cannot practice before field designation.

4-5. End of robot building and practicing time The participant must stop the robot and go back to their seat following staffs' instruction after the time for building robot and practicing.
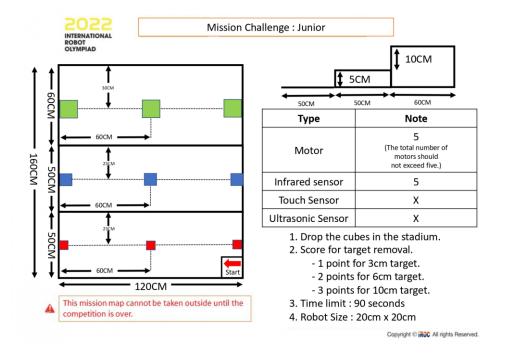
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4-6. 1st trial 1st trial start either directly after the building and practicing time or after lunch.

4-6-1. Before game All participants must bring their robot and follow referee and staffs' direction.

4-6-2. After game All participants should go to the end of the line, not back to the seat, until all participants finish the game.

4-7. Modification All participants get time to modify their robot or practice after their 1st trial. The details are notified on the day.

4-8. 2nd trial 2nd trial of the game starts directly after the modification.

4-8-1. Game preparation All participants must bring their robot and wait following referee and staffs' direction.

4-8-2. Stand-by All participants must go back to their seat after the game till all participants finish the game.

5. Game

5-1. Completing the mission For the games that sequence in collecting the target or the way moving is not given, the participant must their own direction and sequence in collecting the target.

5-2. Acquiring points Points are acquired based on successfully collected targets. Points per target are noticed on the day with the mission.

5-3. Start Start by referee's start sign.

5-3-1. Miss start Considered a 'miss start' when the robot doesn't move in 5 seconds. Two extra trials are given for miss start.

5-3-2. False start Considered a 'false start' when the robot moves before the starting sign given from the referee. One extra trial is given for false start.

5-3-3. Restart Restart is given twice for miss start and once for false start. Maximum trial given as a restart is twice. (One extra trial is given for miss start after a false start.)

5-4. Time limit Total time for the competition is noticed on the day with the mission.

5-5. Mission opening to the public Structure of the field and the missions including the number and placement of the target and destination will be given on the day before competition starts.

5-5-1. Referee explains the mission to the representative of each team. (e.g. throw the 500g target over 1m wall, go to the destination by going over the 1m wall)

5-5-2. Referee explains the scoring rubric of the mission. (e.g. robot must move 3 metal balls under the water as fast as they can. When missing one ball, penalty of 60 seconds will be added to the final time record.)

5-5-3. Rubric is given by quantitative criteria such as time record, distance record and moved numbers of targets. However, the game can be played by knock-out competition ro subjective evaluation.

5-5-4. Referee can notify extra regulations or rules based on the mission given. (e.g. participants must use more than 3 rubber bands.)

5-5-5. Participants can use ordinary supplies not related to the robot such as paper, chopsticks, paper clips, tape, pen, cable ties, binders and paper cups as much as they want without regulation.

5-5-6. Some equipment or tools may be restricted from the host due to safety issues.

Example of the mission

2022
INTERNATIONAL
ROBOT
OLYMPIAD

Mission Challenge : Junior

Type	Note
Motor	5 (The total number of motors should not exceed five.)
Infrared sensor	5
Touch Sensor	X
Ultrasonic Sensor	X

1. Drop the cubes in the stadium.
2. Score for target removal.
   - 1 point for 3cm target.
   - 2 points for 6cm target.
   - 3 points for 10cm target.
3. Time limit : 90 seconds
4. Robot Size : 20cm x 20cm

⚠ This mission map cannot be taken outside until the competition is over.

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5-6. End of the game If the participant

5-6-1. Mission complete If the participant completes the mission, the game ends and the mission points and time record at the moment is approved.

5-6-2. Time limit If the robot fails to go through the arrive within limited time, points at the moment of time limit is approved.

5-6-3. Robot stop If the robot stops during the game, referee can give 10 seconds waiting for the robot to move again. If the robot doesn't move again, robot stop is declared, and points at the moment of robot stop is approved.

5-6-4. TKO(Technical Knock Out) If the robot seems impossible to move, referee can declare TKO in accordance with robot stop. (e.g. moving back and forth repeatedly, stopping at a point caught by an obstacle, robot falling, etc.)

5-7. Game stop upon disqualification If the participant doesn't follow the game rules or disturbs game, the game stops according to disqualification, and the record for the trial does not get approved.

5-7-1. Robot touch If the participant touches the robot without permission from the referee, robot touch is declared and the participant may be disqualified for the trial.

5-7-2. Robot modification during game Participant is not allowed to add, remove, change or exchange any part of the robot during game. If the participant possesses extra component for the robot, tool, or battery to modify the robot, the participant may be disqualified for the trial.

5-7-3. Sensor tuning If the participant tries to tune sensor in the site before game, the participant may be disqualified for the trial.

5-7-4. Breach in field arrangement If the participant practices or plays not in the assigned field, the participant may be disqualified for the trial.

5-7-5. False start If the participant starts a false start twice in a trial, the participant may be disqualified for the trial.

5-7-6. Miss start If the participant starts a miss start three times in a trial, the participant may be disqualified for the trial.

5-8. Rematch Rematch can be held in accordance with referee's decision if unexpected accident such as black out or error in timer happens.

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5-9. Referee's decision Referee has authority to supervise and generalize all situation during the game. Game result is referee's inherent authority and referee's declaration is the final declaration.

6. Record

6-1. Recording subjects Points collected from mission, time record, etc.

6-2. Time record Time recorded via timer or referee's stopwatch is approved. Time record for robot stop, robot falling, TKO is not approved.

6-3. Final record Better record from first and second trial gets approved as final record.

6-4. Priority in record Groups are divided by number of succeeded target mission, and comparison in driving record in each group is considered to choose the ranking.

Mission complete score > Time record availability > Comparison in time record

6-4-1. Priority in trial If the score in each trial is same, record in the other trial is compared to choose the ranking.

6-4-2. Priority when tied Better record upon first or second trial is approved. However, when tied, participant with better record on the first trial is gets priority.