Event 4 – Robo Art Challenge Rulebook

Robo Art	
Location	Arena
2 Rounds	Qualifier and Finale
Per team	10 minutes
Max teams (team of 4): 15	3 hours, 10 minutes
Prize	Point based (in the case of ties, time based)
Jury	Internal

Event Overview: In the Robo Art challenge, teams will develop a robot equipped with a paintbrush (or pen) that will autonomously recreate a design on a blank canvas. The robot will be required to follow a specific pattern or design, translating digital concepts into physical art through controlled movements. The challenge spans multiple difficulty levels, from basic shapes to advanced designs, allowing participants to demonstrate both their technical and artistic skills.

Stages: Qualifiers and Finale (top 4 teams compete in the finale)

Challenge:

Participants must:

1. **Build and program** a robot capable of carrying a paintbrush or similar tool.
2. **Autonomously recreate** an image or pattern on a physical canvas using the paintbrush.
3. The design must be accurately followed, from **simple shapes** (like circles or squares) to **complex geometric patterns** or **artistic sketches**.

Arena Layout & Equipment:

1. **Canvas:**
    - **Size:** 1m x 1m (or as specified for the challenge)
    - The canvas is placed on a flat surface, where the robot must operate.

2. **Robot:**
    - **Paintbrush or Pen Attachment:** The robot must be equipped with a brush or similar implement to transfer paint onto the canvas.
    - **Size Limits:** Robots must fit within the size constraints of **20cm x 20cm x 30 cm** (length x width x height).
    - Robot must not exceed 3 Kgs
    - **Movement Control:** The robot must be programmed to follow the design autonomously. Participants may use wheels, legs, or other means for movement.
3. **Design:**
    - **Pre-selected Designs:** At the start of the competition, participants will be given a design or image they must replicate. This design will vary in complexity depending on the round of the competition (simple shapes for early rounds and complex designs for later rounds).
4. **Materials:**
    - **Paint:** The challenge will provide safe, washable paints of multiple colors.
    - **Canvas:** A clean, white canvas will be provided for each participant.
    - **Brush:** Participants can choose to use brushes of their choice, though the robot must be able to control and hold the brush securely.

Challenge Phases:

1. **Basic Shape Phase:**
    - **Objective:** The robot must replicate simple geometric shapes (e.g., circles, squares, triangles) in a specific arrangement or pattern.
    - **Task:** The robot will be given coordinates and sizes for each shape, and it must paint them precisely.

2. **Intermediate Pattern Phase:**

    - **Objective:** The robot will need to create more complex designs like spirals, grids, or multiple overlapping shapes.
    - **Task:** The robot will be tested on its ability to move across the canvas, maintain consistent brush pressure, and accurately follow the design pattern.

3. **Advanced Artistic Design Phase:**

   - **Objective:** The final challenge will involve replicating a complex design (e.g., a logo, abstract art, or a detailed picture).
   - **Task:** The robot will need to accurately follow the intricate lines, curves, and proportions of the design while managing its paintbrush movements.

Judging Criteria:

Criteria	Excellent (Full Points)	Good (75%)	Average (50%)	Needs Improvement (25%)	No Attempt (0%)	Weight (%)
Accuracy (40%)	Design is replicated with high precision, sharp lines, and accurate shapes	Minor deviations in shape, lines, or proportions	Noticeable inaccuracies, but design is recognizable	Major inaccuracies, shapes distorted, unclear design	No resemblance to the given design	40%
Creativity & Complexity (20%)	Tackles a highly complex design creatively with smooth execution	Moderate complexity with some creative elements	Simple design with limited creative approach	Basic design, lacks creativity or complexity	No attempt at complexity or creativity	20%
Autonomy (20%)	Fully autonomous with no human intervention	Minimal human assistance required	Requires occasional manual corrections	Needs frequent human intervention	Fully manual operation	20%
Speed (10%)	Completes the design quickly and efficiently within the time limit	Slightly slower but within acceptable limits	Noticeable delay but task is completed	Very slow; struggles to finish on time	Unable to complete within time	10%
Aesthetics & Neatness (10%)	Clean application, no smudges, crisp and visually appealing design	Minor smudges or uneven paint application	Some noticeable imperfections, uneven lines	Messy painting with significant smudging/errors	Poorly executed, unclear or overly messy	10%

Prizes and Recognition:

- **Winner:** 5,000 INR + Certificate
- **1st Runner-Up:** 3,000 INR + Certificate
- **Best Innovation Award:** Recognition for the most creative robot design and artistic approach.

Ethics and Conduct:

- All robots must be original creations. Plagiarism or the use of pre-built kits without significant modifications will result in disqualification.
- Teams must respect all event participants and follow the event rules.
- Any unethical conduct or unfair practices will lead to immediate disqualification.