RULE BOOK

6.Line Follower Robot

TASK:

A **line follower robot task** involves designing challenges to test the robot's ability to detect and follow a line, navigate paths, and handle obstacles or varying conditions. These tasks are ideal for showcasing the precision, speed, and programming efficiency of the robot.

DESIGN SPECIFICATIONS:

• The participating bots must be wireless and autonomous
• It can be circular/Rectangular in style
• The bot must fit inside a box 20 centimetres in length, 20 centimetres wide, and 20 centimetres in height at any point in time
• Maximum weight should not be more than 5Kgs including battery, however, a tolerance of 5% in weight is acceptable
• The electric voltage anywhere in the machine should not be more than 16.8V DC at any point in time for each robot
• No wireless communication between the bot and the operator will be allowed. Bluetooth, RF Module, etc not allowed on bot.

GENERAL GUIDELINES:

• The thickness of the line path will be uniform and equal to 3 centimetres
• The lines will be black in colour, on a white background
• The path may consist of straight lines, hairpin bends, acute-angled bends, crossovers (intersecting lines), and curved lines
• The actual path that is to be followed by the robot will be disclosed only during the event
• Short Cuts Not Allowed

❖ JUDGING CRITERIA:

1. **Accuracy & Precision (30 Points)**
   • Successfully follows the line without deviation: **10 Points**
   • Handles turns, bends, and intersections smoothly: **10 Points**
   • Completes the course without errors (no off-track occurrences): **10 Points**

2. **Speed & Efficiency (25 Points)**
   • Finishes the course within the shortest time: **15 Points**
   • Smooth transitions between straight paths and curves: **10 Points**

3. **Obstacle Handling & Adaptability (20 Points)**
   • Successfully navigates all obstacles or varying path conditions: **10 Points**
   • Efficiently handles crossovers and intersections without hesitation: **10 Points**

4. **Design & Construction (15 Points)**

   - Compact and efficient design within specified dimensions and weight: **5 Points**
   - Reliable and robust hardware components ensuring smooth operation: **5 Points**
   - Proper power management within voltage limits: **5 Points**

5. **Code Optimization & Innovation (10 Points)**

   - Well-structured and optimized code leading to smooth execution: **5 Points**
   - Implementation of innovative features (e.g., adaptive speed control, error correction algorithms): **5 Points**

❖ **Total Score: 100 Points**

➢ **Note:**

   - **Tie-Breaker**: In case of a tie, the bot with the **fastest completion time** will be ranked higher.
   - **Disqualification Criteria**:
   - Exceeding weight/size limits.
   - Use of prohibited wireless communication.
   - Manual intervention during the run.
   - Skipping or taking shortcuts.