# TECHNIKA

# TECHNICAL RULE BOOK

# DEV CONTEST (HACKATHON) )

## OBJECTIVE

PARTICIPANTS WILL BUILD A FULLY FUNCTIONAL PROTOTYPE OR APPLICATION BASED ON PROBLEM STATEMENTS PROVIDED AT THE START OF THE EVENT

## TEAM SIZE : 2-4 MEMBERS

## RULES

1. PROBLEM STATEMENTS: TEAMS WILL CHOOSE FROM A SET OF REAL-WORLD PROBLEM STATEMENTS (E.G., SUSTAINABILITY, SMART TECHNOLOGY)
2. PROGRAMMING LANGUAGE & TOOLS: PARTICIPANTS CAN USE ANY PROGRAMMING LANGUAGE OR SOFTWARE TOOLS.
3. DOCUMENTATION: A README FILE DETAILING THE PROJECT AND INSTRUCTIONS FOR SETUP MUST BE SUBMITTED.
4. PRESENTATION: A LIVE DEMO IS MANDATORY.

## JUDGING CRITERIA

* INNOVATION (30%): ORIGINALITY AND CREATIVITY IN SOLVING THE PROBLEM.
* FUNCTIONALITY (30%): HOW WELL THE APPLICATION WORKS.
* USABILITY (20%): USER EXPERIENCE AND INTERFACE DESIGN.
* TECHNICAL COMPLEXITY (10%): CODE SOPHISTICATION AND CHALLENGES OVERCOME.
*PRESENTATION (10%): CLARITY IN PRESENTING THE SOLUTION

# ALGO APEX

## OBJECTIVE

PARTICIPANTS WILL SOLVE ALGORITHMIC PROBLEMS TESTING THEIR KNOWLEDGE OF DATA STRUCTURES, ALGORITHMS, AND PROBLEM-SOLVING.

## DURATION : 2 HOURS

## RULES

1. PARTICIPANTS MUST SUBMIT THEIR SOLUTIONS ELECTRONICALLY THROUGH THE EVENT'S SUBMISSION SYSTEM.
2. SOLUTIONS WILL BE EVALUATED BASED ON CORRECTNESS AND EFFICIENCY.

## JUDGING CRITERIA

*PROBLEM SOLVING (50%): NUMBER OF PROBLEMS SOLVED CORRECTLY.
* EFFICIENCY (30%): TIME COMPLEXITY OF SOLUTIONS. .
*CORRECTNESS (20%): ACCURACY OF SOLUTIONS.

# AMPERE ASSEMBLE

## OBJECTIVE

PARTICIPANTS MUST DESIGN A FUNCTIONAL CIRCUIT BASED ON PROVIDED SPECIFICATIONS, USING NO SOFTWARE TOOLS.

TEAM SIZE: 2-3 MEMBERS

## RULES

1. CIRCUITS MUST BE DESIGNED MANUALLY, WITH ALL CALCULATIONS DONE BY HAND.
2. NO USE OF SOFTWARE TOOLS LIKE MULTISIM IS ALLOWED.

## JUDGING CRITERIA

*DESIGN ACCURACY (40%): HOW WELL THE DESIGN MEETS THE SPECIFICATIONS.
* CREATIVITY (30%): INNOVATION IN THE DESIGN.
*CALCULATIONS (20%): CORRECTNESS OF THE MANUAL CALCULATIONS.
*PRESENTATION (10%): CLARITY IN EXPLAINING THE DESIGN PROCESS.

# ROBO GLADIATORS (ROBO WAR)

## OBJECTIVE

PARTICIPANTS WILL DESIGN COMBAT ROBOTS TO COMPETE AGAINST OTHERS IN AN ARENA.

AREANA SIZE: 10 X 10 FT
ROBOT SPECIFICATIONS : MAX DIM 75 X 75 X 75 CM; WEIGHT LIMIT 19.8KG

## RULES

1. ROBOTS MUST BE BUILT TO DAMAGE OR IMMOBILIZE OPPONENTS.
2. NO FLAME-THROWERS, EXPLOSIVES, OR PROJECTILES ARE ALLOWED.

## JUDGING CRITERIA

*COMBAT PERFORMANCE (50%): ABILITY TO DISABLE THE OPPONENT.
* ROBOT DURABILITY (30%): RESISTANCE TO DAMAGE.
*ROBOT DURABILITY (30%): RESISTANCE TO DAMAGE.

# ROBO SOCCER

## OBJECTIVE

PARTICIPANTS WILL DESIGN AND OPERATE ROBOTS TO COMPETE IN A SOCCER-STYLE MATCH. THE GOAL IS TO SCORE BY PUSHING OR GUIDING THE BALL INTO THE OPPONENT'S GOAL, TESTING CONTROL, STRATEGY, AND MECHANICAL DESIGN.

## DURATION: 2–5 MINUTES PER MATCH

## ROBOT SPECIFICATIONS : MAX DIM 75 X 75 X 75 CM; WEIGHT LIMIT 19.8KG

## RULES

1. EACH TEAM CONSISTS OF 2–4 MEMBERS WITH ONE ROBOT.
2. ROBOTS MUST FIT WITHIN 30CM X 30CM X 30CM AND BE BATTERY-POWERED ONLY.
3. ROBOTS MAY PUSH OR GUIDE THE BALL BUT MAY NOT LIFT OR HOLD IT COMPLETELY.
4. MINOR CONTACT BETWEEN ROBOTS IS ALLOWED; INTENTIONAL DAMAGE OR RAMMING IS PROHIBITED.
5. IF A ROBOT GETS STUCK OR FLIPS, THE REFEREE MAY ALLOW ONE RESET.
6. MATCH DURATION AND ARENA SIZE WILL BE DECLARED BY ORGANIZERS.

## JUDGING CRITERIA

*GOALS SCORED (50%): NUMBER OF VALID GOALS MADE DURING THE MATCH.

* CONTROL & STABILITY (30%): SMOOTH MOVEMENT, BALANCED STRUCTURE, AND HANDLING..

*FAIR PLAY & CONDUCT (20%): CLEAN GAMEPLAY AND ADHERENCE TO RULES.

# DIRT RACE (ROBO RACE)

## OBJECTIVE

PARTICIPANTS WILL NAVIGATE THEIR ROBOTS THROUGH AN OBSTACLE-BASED RACE TRACK. THE AIM IS TO COMPLETE THE COURSE IN THE SHORTEST TIME WHILE MAINTAINING CONTROL, STABILITY, AND AVOIDING PENALTIES. THIS EVENT TESTS DESIGN DURABILITY, SPEED, AND PRECISE MANEUVERING.

DURATION: DEPENDS ON TRACK ATTEMPTS (TYPICALLY 2–3 MINUTES PER RUN)

## RULES

1. EACH TEAM MAY HAVE 2–4 MEMBERS WITH ONE ROBOT. .
2. ROBOT DIMENSIONS MUST NOT EXCEED 30CM X 30CM X 30CM; BATTERY-POWERED ONLY.
3. THE TRACK WILL INCLUDE RAMPS, BUMPS, TURNS, SAND/DIRT PATCHES, AND SPEED BREAKERS.
4. ROBOTS MUST REMAIN WITHIN THE TRACK BOUNDARIES; GOING OFF-TRACK INCURS TIME PENALTIES
5. NO DRAGGING, PUSHING, OR DAMAGING THE TRACK IS ALLOWED.
6. IF THE ROBOT STOPS, A SINGLE RESET MAY BE ALLOWED (TIME RUNS CONTINUOUSLY).

## JUDGING CRITERIA

*COMPLETION TIME (60%): FASTEST VALID RUN.
*STABILITY & CONTROL (25%): SMOOTH HANDLING AND MINIMAL RESETS.
*TRACK DISCIPLINE (15%): AVOIDING OFF-TRACK PENALTIES AND MAINTAINING FAIR PLAY.

# TALL TOWER (STRUCTURAL DESIGN)

## OBJECTIVE

TEAMS MUST DESIGN AND BUILD THE TALLEST, MOST STABLE TOWER STRUCTURE USING THE PROVIDED MATERIALS. THE TOWER MUST MEET SPECIFIC DESIGN CONSTRAINTS WHILE WITHSTANDING WEIGHT OR ENVIRONMENTAL FACTORS. THE FOCUS WILL BE ON HEIGHT, STABILITY, AND STRUCTURAL INTEGRITY, WITH TEAMS JUDGED ON THEIR ENGINEERING APPROACH, INNOVATIVE DESIGN, AND ABILITY TO CONSTRUCT A DURABLE TOWER.

TEAM SIZE: 2-3 MEMBERS

## RULES

1. MATERIALS SUCH AS STRAWS, STICKS, AND TAPE WILL BE PROVIDED.
2. TOWERS MUST BE FREE-STANDING AND SUPPORT A SPECIFIED LOAD DURING TESTING.

## JUDGING CRITERIA

* HEIGHT (40%): OVERALL HEIGHT OF THE TOWER.
*STABILITY (40%): ABILITY TO SUPPORT WEIGHT WITHOUT COLLAPSING.
*DESIGN CREATIVITY (20%): INNOVATION IN THE STRUCTURE'S DESIGN.

# AEROFILIA (BRIDGE THE GAP)

## OBJECTIVE

PARTICIPANTS MUST DESIGN AND CONSTRUCT A BRIDGE MODEL THAT SPANS A GIVEN GAP USING SPECIFIED MATERIALS. THE MODEL SHOULD DEMONSTRATE STRUCTURAL EFFICIENCY, STABILITY, AND THE ABILITY TO BEAR A MAXIMUM LOAD WITHOUT FAILURE. TEAMS WILL BE JUDGED ON THE STRENGTH OF THE BRIDGE, INNOVATIVE DESIGN, AND USE OF MATERIALS WHILE ENSURING THAT THE STRUCTURE ADHERES TO GIVEN CONSTRAINTS.

TEAM SIZE: 2-3 MEMBERS

## RULES

1. MATERIALS SUCH AS STICKS, STRINGS, AND GLUE WILL BE PROVIDED.
2. BRIDGES WILL BE TESTED FOR STABILITY AND STRENGTH.

## JUDGING CRITERIA

* STRUCTURAL INTEGRITY (50%): THE ABILITY TO SUPPORT WEIGHT WITHOUT COLLAPSING.
*EFFICIENCY (30%): USE OF MATERIALS IN A RESOURCE-EFFICIENT MANNER.
*CREATIVITY (20%): INNOVATION IN DESIGN AND CONSTRUCTION

# MULTISIM MAVERICKS(MULTISIM)

## OBJECTIVE

PARTICIPANTS WILL BE REQUIRED TO DESIGN AND SIMULATE ELECTRICAL CIRCUITS USING MULTISIM SOFTWARE. THE CHALLENGE INVOLVES CREATING EFFICIENT AND FUNCTIONAL CIRCUITS TO SOLVE SPECIFIC PROBLEMS, ADHERING TO CONSTRAINTS PROVIDED. TEAMS WILL BE JUDGED BASED ON THE ACCURACY, EFFICIENCY, AND CREATIVITY OF THEIR DESIGNS, AS WELL AS THEIR ABILITY TO EXPLAIN AND OPTIMIZE THE CIRCUITS

SOLO PARTICIPATION

## RULES

1. PARTICIPANTS MUST SUBMIT SIMULATION RESULTS AND DESIGN FILES. .
2. A REPORT EXPLAINING THE DESIGN METHODOLOGY MUST BE SUBMITTED..

## JUDGING CRITERIA

* ACCURACY (40%): CORRECTNESS OF THE SIMULATION RESULTS.
*EFFICIENCY (30%): OPTIMIZATION OF THE DESIGN.
*DOCUMENTATION (20%): CLARITY IN THE WRITTEN REPORT
*PRESENTATION (10%): ABILITY TO EXPLAIN THE DESIGN PROCESS

# STARTUP SPHERE

## OBJECTIVE

PARTICIPANTS MUST PRESENT A STARTUP IDEA TO A PANEL OF JUDGES, INCLUDING MARKET ANALYSIS, BUSINESS MODEL, AND FINANCIAL PROJECTIONS.

## RULES

1. TEAMS WILL HAVE 10 MINUTES TO PRESENT THEIR IDEAS.
2. VISUAL AIDS ARE ENCOURAGED.
3. A Q&A SESSION WILL FOLLOW THE PITCH.

## JUDGING CRITERIA

* INNOVATION (40%): ORIGINALITY AND FEASIBILITY OF THE STARTUP IDEA.
*BUSINESS PLAN (30%): CLARITY IN MARKET ANALYSIS AND FINANCIAL PROJECTIONS.
*PRESENTATION SKILLS (20%): EFFECTIVENESS OF THE PITCH.
*Q&A HANDLING (10%): CONFIDENCE AND CLARITY IN ANSWERING QUESTIONS

# CAD MASTER (AUTOCAD / SKETCHUP DESIGN CHALLENGE)

## OBJECTIVE

PARTICIPANTS WILL DESIGN A 2D/3D MODEL BASED ON THE GIVEN PROBLEM STATEMENT USING CAD SOFTWARE. THE EVENT EVALUATES DESIGN ACCURACY, CREATIVITY, AND ADHERENCE TO TECHNICAL SPECIFICATIONS.

DURATION: 1–2 HOURS

## RULES

1. PARTICIPANTS MUST WORK INDIVIDUALLY.
2. THE PROBLEM STATEMENT WILL BE PROVIDED AT THE START OF THE EVENT.
3. ONLY APPROVED CAD SOFTWARE (SUCH AS AUTOCAD, SOLIDWORKS, FUSION 360, OR SIMILAR) MAY BE USED.
4. INTERNET USAGE IS NOT PERMITTED DURING THE CONTEST.
5. DESIGNS MUST BE ORIGINAL AND CREATED WITHIN THE EVENT DURATION.
6. FINAL MODELS MUST BE SAVED AND SUBMITTED IN THE REQUIRED FILE FORMAT SPECIFIED BY ORGANIZERS.

## JUDGING CRITERIA

* ACCURACY TO PROBLEM REQUIREMENTS (50%): CORRECT DIMENSIONS AND FEATURE PLACEMENT.
*DESIGN QUALITY & DETAILING (30%): CLEAN MODELLING, CONSTRAINTS, AND PROPER USE OF TOOLS.
* PRESENTATION/FINISH (20%): NAMING CONVENTIONS, NEATNESS, AND COMPLETENESS OF VIEW RENDERING.

# UTILITY BOT (UTILITY MACHINE)

## OBJECTIVE

PARTICIPANTS WILL DESIGN AND PRESENT A ROBOT CAPABLE OF PERFORMING A USEFUL REAL WORLD TASK SUCH AS LIFTING, SORTING, TRANSPORTING, CLEANING, OR ASSISTANCE-BASED OPERATIONS. THE EVENT EVALUATES CREATIVITY, PRACTICALITY, ENGINEERING DESIGN, AND OPERATIONAL EFFICIENCY.

## RULES

1. TEAMS MAY CONSIST OF 2–4 MEMBERS WITH ONE ROBOT
2. THE ROBOT MUST BE BATTERY-POWERED AND SELF-CONTAINED (NO EXTERNAL POWER OR WIRED REMOTE).
3. THE TASK DEMONSTRATION WILL BE BASED ON A GIVEN SCENARIO OR THE TEAM'S CHOSEN UTILITY FUNCTION (WHICH MUST BE DECLARED BEFORE EVALUATION).
4. ROBOTS MUST BE SAFE TO OPERATE: NO SHARP EDGES, FIRE, OR HAZARDOUS MATERIALS.
5. ANY PRE-BUILT KITS MAY BE USED, BUT INNOVATION AND MODIFICATIONS WILL CARRY MORE POINTS.

## JUDGING CRITERIA

* FUNCTIONALITY & TASK COMPLETION (50%): HOW EFFECTIVELY AND RELIABLY THE ROBOT PERFORMS THE INTENDED TASK.
*DESIGN & INNOVATION (30%): CREATIVITY, MECHANISM DESIGN, AND WORKFLOW.
* BUILD QUALITY & SAFETY (20%): STRUCTURAL STRENGTH, WIRING NEATNESS, AND SAFE OPERATION.