Boeing, IITs & KIIT

present

National Aeromodelling Competition 2025-26

Zonal Round Problem Statement

Format of the Competition

1. **Selection to participate in Zonals** through the screening of Abstract of Design, its explanation, and pictures (given in subsequent paragraphs).
2. **Zonals.** The zonal events will be conducted in:
    a. IIT Gandhinagar
    b. IIT Kanpur
    c. IIT Madras
    d. KIIT Bhubaneswar
3. Participants can register the team to participate only in the zones based on the location of their college/university. (See section on Zones for more details)
4. The Participants will bring their aircraft and all necessary equipment to participate.
5. Top 3 teams from each zonal round will be invited to the national finals at IIT Delhi.

Problem Statement for the Zonal Rounds

- Team (composition defined later) is responsible for designing and operating a radio-controlled aircraft (more details on the aircraft specification in the Design Constraints Section).
- The goal is to enable the aircraft to maximize payload capacity relative to its own weight and successfully deliver it to a designated area. Golf balls will be offered as payloads: Weight of 45g; Diameter of 43 mm.
- Payload will be supplied by the organizers during the competition.
- The arena will be an open ground.
- There will be two rounds in the zonal competition.
    A. **Qualifier Round** - to select the top 30 teams for the Main Round
    B. **Main Round** - to select the top 3 teams to participate in Finals to be held at IIT Delhi

A. Qualifier Round

- The objective of the qualifier round is to select the top 30 teams who:
    - Have built aircraft with strong payload-carrying capabilities, and
    - Can fly safely while carrying the payloads.
- The aircraft should carry the payload for a minimum of 30 seconds.
    - The payload should be carried inside the aircraft and not exposed externally.
    - Judges will inspect the aircraft and permit take-off only if they are satisfied with the payload mounting mechanism. A maximum time of 3 minutes will be given between the takeoff and the landing, and the aircraft should complete the round within the time limit.

$$\text{Score} = \frac{\text{Weight of Payload Carried} * 100}{\text{Weight of Aircraft without Payload}}$$

- Teams whose aircraft cannot maintain flight for 30 seconds with the payload will receive a score of zero.
- Only aircraft that safely fly with the payload in the Qualifier Round will advance to the Main Round. Each team will get 2 attempts and the best of the two will be the team's final score.
- From the Qualifier Round, based on the score, the top 30 teams, will qualify for the Main Round.
- **Reimbursement: In addition to advancing to the next round, qualifying teams will receive a reimbursement of INR 5000 per team to cover material costs for their models. The qualifying team must provide the bank account details of one team member to facilitate the reimbursement.**

B. Main Round

- The aircraft should carry payload of independent golf balls and drop them in a circular drop zone of 20m diameter.
- The drop should be performed after a minimum flight time of 30 sec after take-off.
- All the payloads in/on the aircraft should be released in a single drop.
- The payloads should fall as independent objects and should not be joined together as one bigger payload (sticking them together or dropping a box with multiple payloads in it etc. is not allowed).
- The entire payload should be released using only one channel in the transmitter.
- The drop zone is at 40m from the take-off and landing zone.

$$\text{Score} = \frac{\text{Weight of Payload Dropped in the zone} * 100}{\text{Weight of Aircraft without Payload}}$$

- Each team gets 2 attempts in the main round. The best score of the two will be considered as the Main round Score.
- A maximum time of 3 minutes will be given between the takeoff and the landing in each attempt. The aircraft should complete the drop and land within the time limit.

Zonal Winners:

Final Score = (0.25 x Score in Qualifier Round) + (0.75 x Score in Main Round)

1. Top 3 teams with the highest final score will be declared as winners of the Zonal.
2. If there is a tie, the winner will be decided by a separate round framed by the Judges on the spot. Judges' decisions would be considered final in all cases.
3. Winning Top 3 teams will be invited to IIT Delhi for the finals.
4. The problem statement for the final round will be launched after completion of all the zonal rounds

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Design Constraints:

Aircraft:

1. The competition requires participants to design and fabricate a Fixed Wing RC aircraft. Readymade models like RTF, ARF, BNF etc., are not allowed.
2. T/W <=1.5 without payload (If excess thrust is measured, it will be neutralized by adding weight below the aircraft at the center of gravity)
3. The aircraft should have a maximum weight of 800 grams (without any payload)
4. The propeller diameter should not be greater than 13 inches.
5. The wingspan should be a maximum of 1 m.
6. Only electric motors are allowed. Using IC engines or any other means of providing thrust is prohibited.
7. Use of gyroscopes (gyros) and programming assistance in receivers is prohibited.
8. Programming for any step of the mission is not allowed.
9. Use of FPV or any other support for flying is not allowed.

Team structure:

1. Maximum Team Size: 4
2. Minimum Team Size: 2
3. An additional mentor can accompany the team but will not be allowed to help them during their participation.
4. Team members may be from the same college/school or different (School/UG/PG). However, all the schools/ colleges should be within the same zone. (See section on Zones for more details)
5. Any number of teams can participate from one college/school.
6. Only students can participate in this competition.
7. Participants must get a bona fide certificate signed by the respective HoD/Dean/Principal and their school/college ID Card.

A safety pilot may be available on the ground, provided by the organizers, to take control of the aircraft in case of an emergency. Participants can choose to fly independently or seek the safety pilot's assistance. If the safety pilot determines that the participant's skills are insufficient, the pilot will take control for safety reasons. The safety pilot and judges will make the final decision, and participants must comply with their instructions.

Zones:

Your team can participate only in the zones based on the location of your college/ school as defined below:

- IIT Gandhinagar
- IIT Kanpur
- IIT Madras
- KIIT Bhubaneswar

KIIT Bhubaneswar

a. Arunachal Pradesh
b. Assam
c. Bihar
d. Chhattisgarh
e. Jharkhand
f. Manipur
g. Meghalaya
h. Mizoram
i. Nagaland
j. Odisha
k. Sikkim
l. Telangana
m. Tripura
n. West Bengal

IIT Kanpur

a. Delhi
b. Haryana
c. Himachal Pradesh
d. Jammu & Kashmir
e. Ladakh
f. Punjab
g. Uttar Pradesh
h. Uttarakhand

IIT Gandhinagar

a. Goa
b. Gujarat
c. Maharashtra
d. Rajasthan
e. Madhya Pradesh

IIT Madras

a. Andaman and Nicobar Islands
b. Andhra Pradesh
c. Karnataka
d. Kerala
e. Lakshadweep
f. Tamil Nadu

Abstract Submission to Qualify for Zonals:

1. All participants must submit an abstract of their aircraft in A4 size with 1.5 line spacing and standard formatting, totaling no more than 15 pages. They must also submit a zip file containing at least 5 and no more than 10 photographs of the aircraft during its construction.
2. The abstract must document the basic design of the aircraft (including dimensions, wing areas, velocity, etc.) and explain how the design addresses the given problem.
3. Download the standard format from the respective IIT websites.
4. The abstract must be submitted at least 20 days in advance of the competition date.
5. The abstract must be submitted according to the specified format by sending an email to: <insert corresponding email ID for each zonal>.
6. The shortlist of teams based on the abstract, eligible to participate in the zonal rounds, will be announced 15 days before the competition date.

If multiple teams are participating from the same school or college, each team's aircraft design must be distinct. There should be a minimum 2.5% difference in the dimensions of the following: wingspan, chord, and fuselage length. Any teams from the same institution found in violation of this clause will be disqualified.

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General Guidelines

1. The same aircraft must be used in both rounds and should match the one submitted in the abstract. In the event of damage during the competition, teams may repair the aircraft but are not permitted to use a replacement. The repaired aircraft must be ready in time for the next turn. Teams are suggested to carry additional components (motors, batteries, propellers, etc.) to avoid last-minute surprises at the venue. You will lose time/ attempt if you are not ready at your turn.
2. The use of 2.4 GHz radio is required for all aircraft competing. If the participants want to use any other frequency, they must inform the organizers in advance.
3. Receivers installed in the aircraft must be in 'receiver mode only'.
4. Metal propellers are not allowed.
5. Organizers will check all the systems (Servos, motors, etc.) for functionality before the competition. If found not working, teams will be dismissed from the competition.
6. Please do not share parts of your aircraft (motors, ESC, Battery etc.) with other teams. Each team is expected to carry all the equipment needed to participate in the competition.
7. The models can have powered take-off with landing gear or be launched manually by a person standing at ground level.
8. A team member cannot be a part of more than one team.
9. The timer will start after 120 seconds of the previous team completing their attempt. The participants must be prepared in time and launch without delay after entering the take-off zone. The teams would lose their turn if they were not ready in time.
10. To be eligible for the reimbursement, the qualifying team must share the bank account details that belong to one of the team members. The name on the bank account must match the registered participant's name. Reimbursement/ Prize money will not be transferred if there is a mismatch.
11. In view of stringent safety requirements, if a pilot flies out of the designated flying zone, which includes the overhead of the event organizing and control section, as mentioned at the venue, he/ she is disqualified. He/she must immediately turn back and land safely.
12. The arena/ location of take-off and drop zones might vary based on the actual ground and wind conditions.
13. Participation in multiple zonal events and finals
    a) Teams can participate in only one zonal event.
    b) The same team members participating in the zonal should participate in the final.
    c) Any attempts to unfairly influence the scoring or disrupt the competition by teams or individuals associated with them, such as parents, professors, trainers, etc., will result in immediate disqualification of the teams.

Revisions

Any revisions to the competition scope will be communicated to all participants via registered email and updated on the websites of the respective technical festivals.