SAP-ON

Pool Event   **Points: 30**

PROBLEM STATEMENT

Design a **truss bridge** on **SAP2000** software satisfying the stated constraints.

1. Event Structure

Single Round event, each pool has to submit one SAP2000 model of a truss bridge.

Only one submission from each pool will be accepted.

2. Dimensions, Material and Weight requirements

- The truss bridge should have the following dimensions:
  - Length = 25m
  - Width =   3m
  - Height <= 5m
- The bridge can be made of any section and can be of any configuration, the choice of section for truss elements is upto participants
- The material of the truss members would be Fe 250 only.
- There is a cap on the weight of the bridge.

3. Pool event:

Only one submission will be accepted from each pool.
For 2nd and 3rd year students.

4. Judging and Scoring

First the structure will be reviewed to check if it violates any rules mentioned in section 2.
The scoring of the structure will be based on performance as well as aesthetics.

In engineering, the best solution may not always be the biggest or strongest bridge.

- The bridge will also be scored on aesthetics. The judges will judge the bridge based on the uniqueness of the design and its overall look.

- Scoring Elements :
    - **DEFLECTION:** The deflection of the bridge will be checked for various combinations of concentrated and uniformly distributed loads.

    - **WEIGHT:** The weight of the bridge will be calculated by the reaction forces.

    - **AESTHETICS:** Up to the discretion of the Judges.

- Scoring Criteria:
    - Deflection (D): 100 points will be awarded to the team with the lowest deflection, 30 points to the team with the highest value of deflection , and all others will be awarded points based on linear interpolation between these two extremes
    - Weight (W): 100 points will be awarded to the team with the lowest dead weight, 20 points to the team with the highest value of weight, and all others will be awarded points based on linear interpolation between these two extremes.
    - Aesthetics: points for aesthetics (A) will be awarded by the judge out of 100.
    - Total Score:
        Total score (T) will be calculated as follows:

$$T = D*0.4 + W*0.35 + A*0.25$$

Violating any of the conditions mentioned above, penalty will be imposed according to the judges and may lead to disqualification:

- Dimensional specifications are not met
    (**Penalty of 20% of the total score**)

(Penalty of 40% of the total score or can lead to disqualification as decided by the judges)

- In case of any discrepancies, the decision taken by the judges and the council will be the final verdict.

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