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SHREE RAMCHANDRA COLLEGE OF ENGINEERING

Lonikand, Pune – 412216

Case study of Internship/Industrial training

- **Title of Training:** Industrial Training Program for students at "Metamorphosis Engitech India Pvt. Ltd, (MEIPL) Unit II, A/P- Pimple Jagtap, Pune"

- **Schedule of Training: 1. In-campus training:** from 25/10/2019 to 04/11/2019
  Time: 9:00 am to 5:00 pm (Only on Sat & Sunday)
  2. In Industry: from 28/09/2019 to 05/03/2020
  Time: 10:00 am to 01:00 pm

- **Name of Trainer:** 1. Mr. Hemant Agarwal (CEO & Whole time Director)
  2. Mr. Sandip Kapoor. (Consultant 40+ years Exp.)
  3. Mr. Anthony Chacko. (Consultant 40+ years Exp.)

- **Industrial training:**

In BE Electrical syllabus subjects like Power electronics controlled drives , Power system operation and control, control system in which following topics are covered and also the training on similar topics is given to the students in industry and in campus by the experts. To enable the students to understand the operation, application and control of speed of AC & DC motor, to provide electric AC & DC drive to cater to industrial needs, to familiarize the operation principles, and design of starting, braking, and speed control arrangements for electric motors and their applications, to provide strong foundation to asses performance of different industrial drives considering issues such as, energy efficiency, power quality, economic justification, environmental issues, and practical abilities. We conduct this training for students from last three years.

- **<u>Benefit of training to the students</u>**

The students were able to get exposure in the industrial working environment with the hands- on training of various equipments and machineries. Students got the knowledge regarding the application of theory and its practical implementation for industrial applications.

- **<u>Placement</u>**

Few of the students from Electrical and E&TC departments those who attended the training, based on the vacancies existing at MEIPL are recruited by above said industry.

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Photos of Training

Industrial training at MEIPL

Production Floor of Company

Training conducted by Mr. Agarwal (CEO & Director) and Mr. Sandip Kapoor (Consultant) MEIPL, Sanaswadi, MIDC.

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Title of Project:

"Solar Eco-technology Innovation in Electric Vehicle" – B.E. (Electrical) Final year students.

Purpose

The development of electric vehicles (EV's) has been chosen as the strategy for the solution of rising air pollution and the energy consumption all over the world. This project provides a general introduction to available and emerging technologies for dynamic power transfer to moving vehicles. The main attention of this project is directed to the technology for interfacing the moving vehicle to the stationary infrastructure. Transport is a fundamental requirement of modern life, but the traditional combustion engine is quickly becoming outdated. Petrol or diesel vehicles are highly polluting and are being quickly replaced by fully electric vehicles and have zero tailpipe emissions and are much better for the environment. The technology overview is presented in two parts, where the first part is technologies based on conductive power transfer by sliding contacts while the second part is technologies based on direct power transfer from battery for avoiding mechanical contact.

Project Objectives are as under :

- To build a green vehicle that runs on sun's energy
- To eliminate the need to drive everywhere, especially short trips
- To promote the usage of green alternative energies.
- To develop a vehicle that use renewable energy, environmentally friendly and cheap.
- To convert the solar energy to the electrical energy by using solar cells, then Converting this electrical energy to mechanical energy by using DC motor to run the e-car beside the human paddling.
- To design e-car that works on throttle to reduce manual effort.
- To advance the e-car that can charge even while travelling by addition of foldable solar panel.

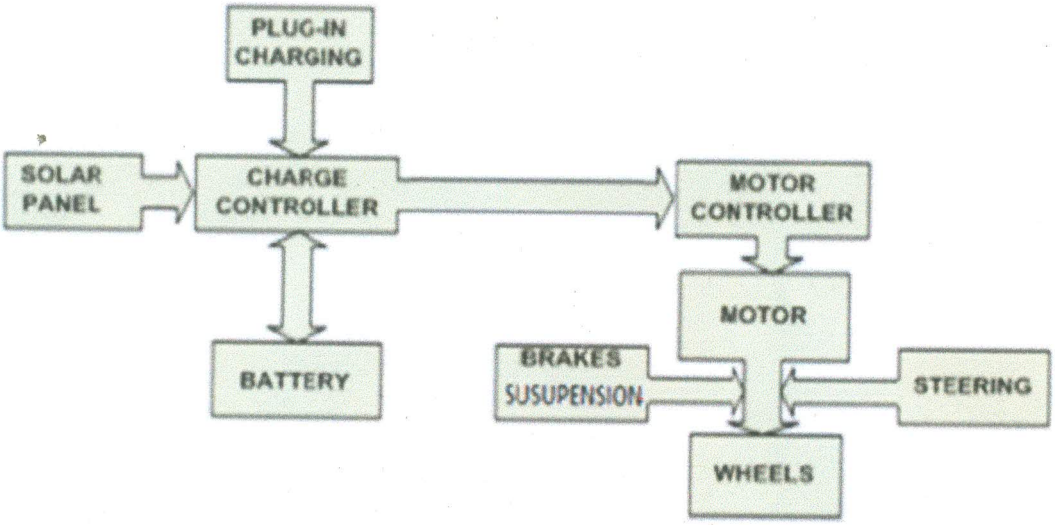
Methodology

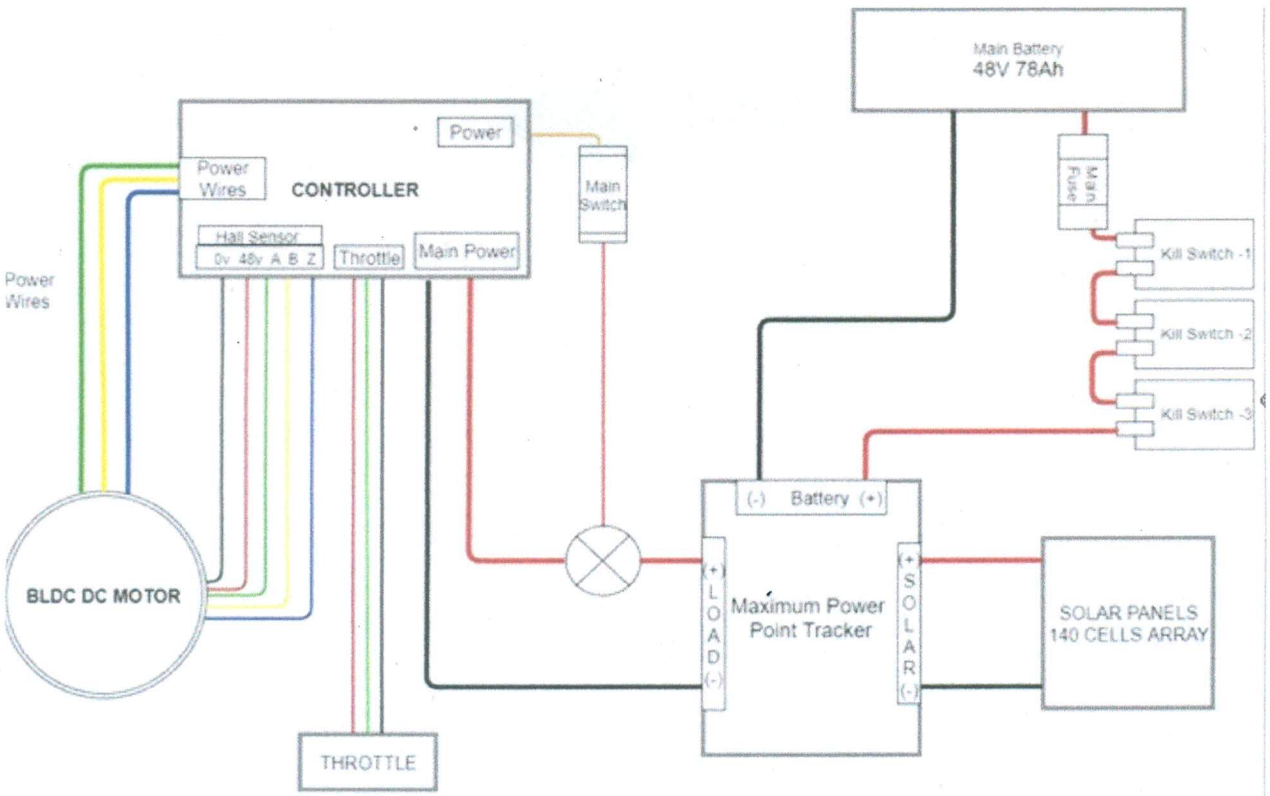
This vehicle is a small capacity prototype which can be further developed as a multiseater cart used on golf ground, resorts, etc. The main highlight of the vehicle is the use of electric motor which is powered by battery and solar panels. The project is to demonstrate the possibility of the concept to a actual usage. The prime mover of the vehicle is electric motor. The motor is powered by electric battery. For initial prototype, to keep cost low, brushed DC motor and lead acid battery is proposed.
The battery can be charged by wall charger. Vehicle also has solar panel, which can give power to low-capacity motor in bright sunlight. The solar panels will also charge battery. The solar panels has solar charge controller (maximum power point tracker), which regulates the voltage. This is required because output from solar panel is not constant. Hence, charge controller will maintain required voltage range and extract maximum power from the panel at that instance.

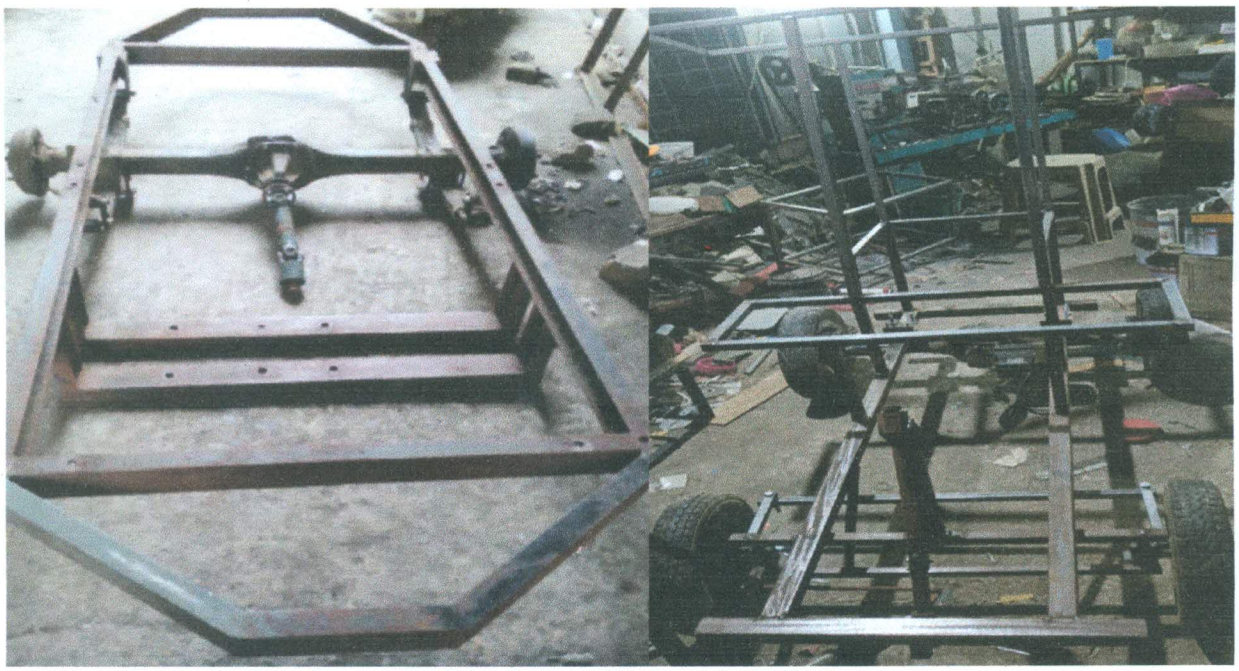
Design part:-

Sr. No.	Parts of body
1	Chassis & Transmissionwith Motor
2	Battery & Connection
3	Solar panel
4	Wheels
5	Seat
6	Brake Assembly
7	Steering Set

Fabrication:-







Major technical specifications of materials/items used

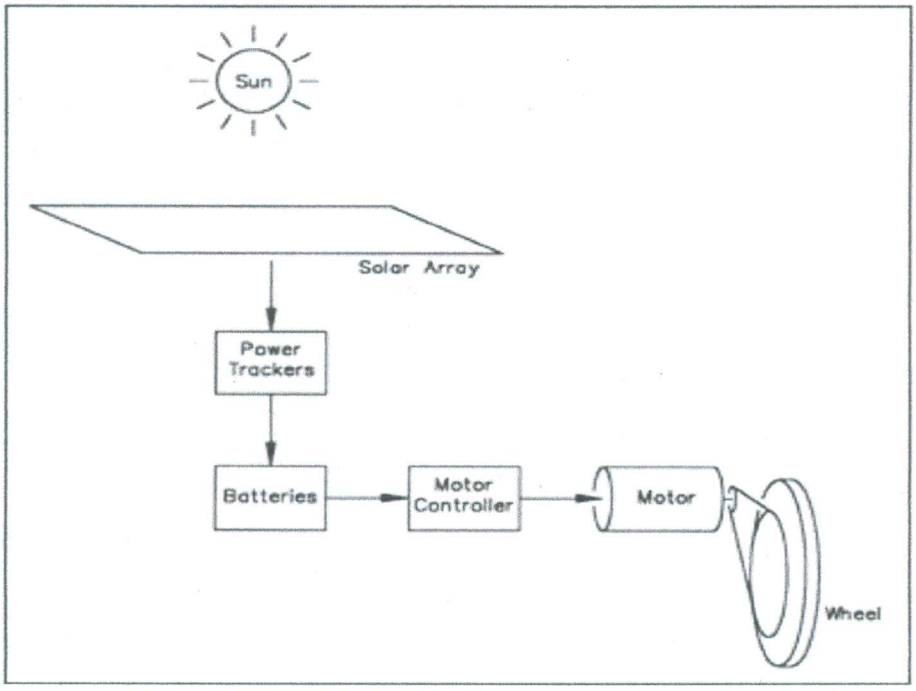
Dimensions: -

- Wheel Track: - 3 feet
- Wheelbase: - 4.25 feet
- Overall length: - 6 Feet
- Overall height: - 4.54 Feet

C.G. Specifications:

- From Ground (Gz) = 383 mm
- From front end (Gx) = 662.18 mm
- From vehicle axis (Gy) = 0.93 mm
- Total vehicle weight: - Approximate 180 kg
- Motor: - Permanent Magnet BLDC motor of 1000 W, 48 V, 2700 rpm, 23 N-m.
- Battery: - 4*12-volt, 42 Ah (lead acid battery)
- Transmission: - Differential Gear assembly
- Brakes: - Rear Drum Brakes
- Steering: - Rack steering Mechanism
- Body Works: - Chassis and Steering of M.S.

Electric power flow diagram



Conclusions

The progress that the electric vehicle industry has seen in recent years is not only extremely welcomed, but highly necessary in light of the increasing global greenhouse gas levels. As demonstrated within the economic, social, and environmental analysis sections of this webpage, the benefits of electric vehicles far surpass the costs. The biggest obstacle to the widespread adoption of electric- powered transportation is cost related, as gasoline and the vehicles that run on it are readily available, convenient, and less costly. As is demonstrated in our timeline, we hope that over the course of the next decade technological advancements and policy changes will help ease the transition from traditional fuel-powered vehicles. Additionally, the realization and success of this industry relies heavily on the global population, and it is our hope that through mass marketing and environmental education programs people will feel incentivized and empowered to drive an electric- powered vehicle. Each person can make a difference, so go electric and help make a difference. The design is to meet the operational constraints with minimum power requirement. The study reveals that the extended constant power operation isimportant for both the initial acceleration and cruising intervals of operation.

Future Scope

The term "solar vehicle" usually implies that solar energy is used to power all or part of a vehicle's propulsion. Although electric vehicle with solar panels at the top is not a practical or economic solution of transportation at present, in the future they may play a major role in reducing usage of fossil fuels such as petrol and diesel etc. are not a practical or economic form of transportation at present, in the future they may play a part in reducing our fossil fuels such as petrol and diesel.

List of Group of Project students:-

Sr.No.	Name of students	Enrollment No.
1.	Rodge akshay keshavrao	12019138941
2	Borkar rajashree rajendra	12019138960
3	Nananaware dattatraya pandurang	12019138933
4	Halunde omkar bharma	12019138965
5	Rane roshan sunil	12018262759

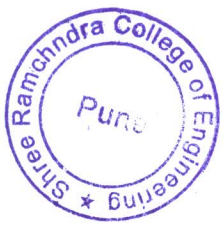


Fig:- The actual photograph of e-vehicle with solar panel

Note: - Thus through Project work , students learn about experimental ,participative and problem solving tools as well as mathematical and analytical methods.

Project Guide
Prof. S.P.Arbale

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H.O.D.
Prof. V.M.V.Rao

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Reference No:- SRES/SRCOE/2018-19/MECH/E-01 Date: 15/02/2019

Report of an Event

Title of Event: "Go-kart competition organized by AIRC"

Date: 6th to 9th Feb2020

Venue – Ajinkya D. Y. Patil Knowledge City, Lohgaon, Pune

Objective of Event:

- To gain knowledge practically how to design and developed the four wheeler vehicle
- To learn the design consideration were four simple goals applied to every component of the vehicle: durable, Safety & ergonomics, light-weight and high performance.
- Improve problem solving Methodology.

Details of Event

The Go-kart competition organized by AIRC (Auto India Racing Championship) to bring and enhance Engineering approach towards vehicle design, manufacture .The project was taken up by the team to have a practical exposure to market and apply concepts which is an integral part of Engineering and comes through participation in such practical working events. Students work to improve the process and methodology to produce a low cost go-kart chassis by modeling it with ANSYS software which will be later built by using locally available materials and tools according to the AIRC rulebook. Design and fabrication of the Go-kart focuses on developing a simple, lightweight and easily operated vehicle, aspects of ergonomics, safety, ease of manufacture, and reliability are incorporated into the design specifications. Analysis is conducted on all major components to optimize strength and rigidity, improve vehicle performance, and to reduce complexity and manufacturing costs.

Go-kart event held at Ajinkya D. Y. Patil Knowledge City, Lohgaon, Pune dated between 6th to 9th Feb2020, where 24 teams participated and around 15 students along with 2 faculty member of SRCOE as a team participated in event. Students designed, manufactured and developed the Go-kart vehicle name as Team Dominator. In this event total 6 stages of competition were as follows

1. Normal vehicle inspection
2. Acceleration test
3 .Break test
4. Auto cross
5. Skid pad
6. Main race

Our Team Dominator got 389 points out of 600, and secured 9th Rank out of 24.Also it finished as Runner up for CAE design Competition.

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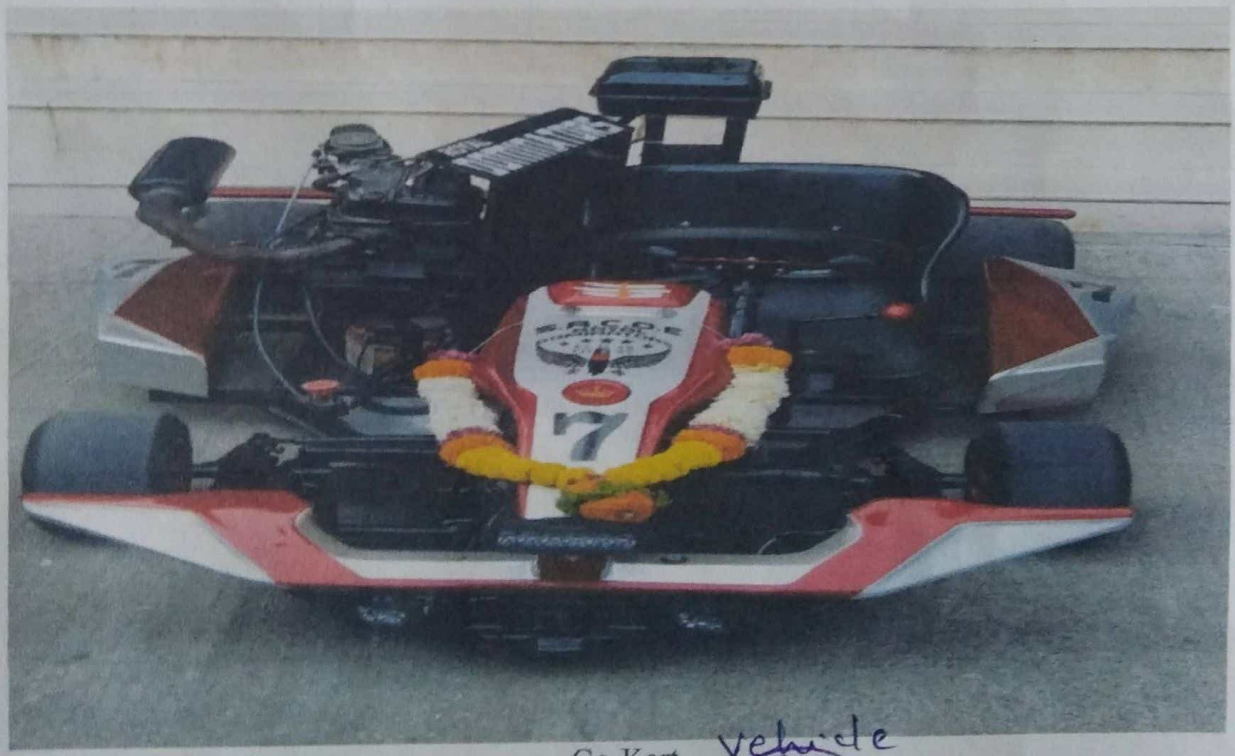
✓ **Attachments (if any):** Participant list, photos of Event

Participant list-

Sr. No		Name Participant
1	Students	Shirke yogesh
2		Sumit khodade
3		Arjun senghar
4		Vishal sangale
5		Hanumant chavan
6		Aniket mahadik
7		Akshay mulik
8		Nitin Bhujbal
9		Rushabh Rajale
10		Rajat Bhaisare
11		Shubham pansare
12		Saurabh magar
13		Aniket sudake
14		Sagar pagare
15		Nikam Prasad
16	Staff	Prof.A.U.Padekar
17		Mr. Mahajan V.C

Photos of Event



Go-Kart – Vehicle

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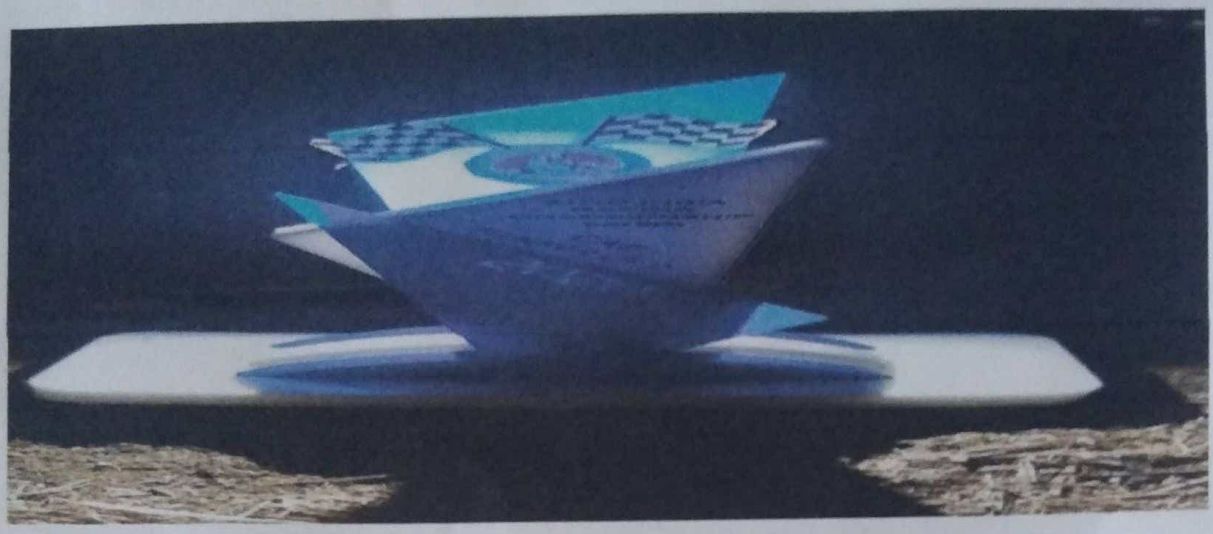

Runner-up Trophy

SRCOE 'Team Dominator'

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Event photo during main race

Prepared By
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Checked By
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SAE Co-ordinator

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