

CONCEPT CAR CHALLENGE

EVENT DESCRIPTION :

An automobile is like any system be it living or non-living is an amalgamation of various systems. The engine, suspension system, aerodynamic design, cooling system, transmission system and many more components all perform in coherence to produce your ride. Lot of research and vision is put forth to analyze and improve the slightest inch of performance possible at any segment of the automobile. This event is a small scaled venture for those students who have the acumen and passion to devise methods to solve certain problems hence moving forward to build their concept car!

Concept car challenge is a core engineering event where the participants have to design a car in line with the problem statement.

FORMAT :

Phase 1:

Given certain PROBLEM STATEMENTS; choose ANY ONE amongst them and submit an abstract comprising of ideas to overcome that problem. Your abstract must have a paragraph explaining your idea, along with pictures/diagrams/sketches/videos/animations or any suitable aids.

Phase 2:

Depending upon your ideas you will be selected and you would be expected to thoroughly overcome the problem, hence have the entire model designed (either as a CAD Model or a small model/prototype), analyzed either with thorough manual calculations or using analyzing softwares and have a reasoning for all aspects of the design.

RULES :

Maximum of three members per team. One entry per team only.

- Participants selected for the presentation round are required to carry a bonafide certificate or identity card of their institute.
- The duration of presentation is not to exceed 5 minutes for Phase II.
- The presentation shall be followed by a question and answer session.
- Any design software (3DsMax, Catia, Pro-E, Rhino, Alias and Solid Works only) or hand drawn sketches may be used for the presentation.
- For the preliminary stage an abstract not exceeding one A4 page (std. font sizing) along with the preliminary / basic design of your concept should be submitted by 14th February 2015 to c3@pragyan.org based on which the participants will be shortlisted.
- Shortlisted participants will be informed by mail so that they can proceed with phase II.
- Selected participants from Phase I are required to bring a hard copy of the abstract which was submitted earlier and the soft copy of the presentation to be presented for Phase II.
- Kindly note that the images supporting the design (if any) have to be in any of the following standard image formats (jpeg, bmp, gif, png, tif only.)
- Participants are to note that judge's decisions are final and binding.

JUDGING CRITERIA :

For 1st Round, (Last Date 14th Feb):

- 1) Ideas provided to solve the problem statement (30)
- 2) Originality of the idea (20)
- 3) Calculations/ Analytical Details given (20)
- 4) Diagrammatic explanations (10)

5) Explanations through other Aids (20)

Not much Focus given to : Cost Effectiveness and the Feasibility/ Marketability of the product as well as minute details in the design / idea.

- Submission should be in the form of a Microsoft Word File with all other files linked to it.
- If any other files which can't be linked are being submitted they should be mentioned in the Word File along with their relevance and necessary explanation as to what purpose they are serving in explaining your idea.

For 2nd Round: (Final Round Participants will be informed by 15th Feb- Giving 10 days to come up with final designs and solutions)

- 1) Evolution of the idea from the first round / Deviation from first round. (Whether they have used the same idea or changed it a lot-reduction of points in case of the latter) (5)
- 2) Completeness of the Idea. (Whether all aspects and details are thought upon or the idea is left quite loose ended) (5)
- 3) Whether the solution is feasible? Will it actually solve the problem? How? (30)
- 4) Complete Analysis/ Calculations/ details/ Explanations of all aspects of the design in the presentation. (20)
- 5) Sketches/ CAD Model/ Drawings in Different Views / Assemblies (20)
- 6) Cost effectiveness of the model/ Marketability of it as a product (10)
- 7) Animations/ Dynamic Study/ Explanations in the presentation provided through other Aids. (10)

PROBLEM STATEMENT :

1. Collapsible Light Weight Chassis:

Given the excessive emergence of the automotive sector and constantly growing number of cars on the roads, equally alarming is the issue of space required for parking of these vehicles. Hence it is of an urgent need to come up with innovative solutions for building cars which can be made to occupy lesser space while parking. Hence, Create an Automobile Chassis which can be Shrunked/ Collapsed/ Folded and Reformed to original form when needed. The participants have to give proper Sketch/Drawing/CAD models in any of the software and preferably an animation/prototype showing the working of linkages to achieve the above.

2. Transmission System:

While designing off-road vehicles; one aspect that's been puzzling the designers is the adaptability of the vehicle for both on-road conditions as well at the same time make it maneuverable while enduring steep slopes and banked curves in hills/embankments. Design a Transmission System (Gearbox, Differential and Shaft Radius) for a Given Power, Max Torque and Wheel Radius for a four-seater road vehicle. THE CAR HAS TO GO OVER A BRIDGE WITH 32° INCLINATION. The gear box can be a commercial or custom made.(Basic sketch/diagram or CAD model showing arrangement of gears in the gearbox with reasoning for choosing gear ratio values, also comment upon the weight of the car taken, making it sufficient for at least 4 people at a time).

Power (Max): 88.8 BHP @ 4000RPM

Torque (Max):219.7N/m@ 1800 RPM

Wheel Diameter: 16 inch

3. Innovative Braking System:

A lot of energy from your hard-earned fuel (see petrol price) is wasted while braking. You are required to design a braking system that will store this energy and utilize it to power the automobile. A lot of such systems have been developed but not widely applied. Those ideas can be used for inspiration but the judges will grade teams only on the basis of your originality.

4. Innovative Damping in Suspensions:

Damping in Conventional Automobiles mainly works by using the frictional forces and energy of passing a fluid through an orifice. Although it provides a ride comfort, it does consume a lot of power! Try to come up with a way to harness this power lost in damping in a suspension.

Images corresponding to the problem statement:

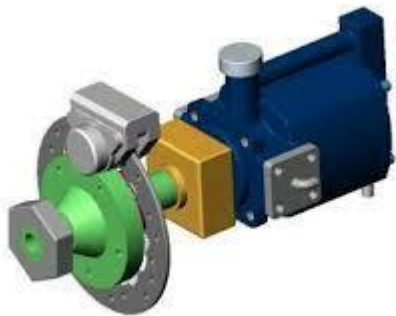
1.



2.



3.



4.



FAQ :

1. Who can participate?

Students from any college/university can participate.

2. Do I need to be in a team or can I participate individually?

Yes, you can participate individually. But we encourage you to have a team of at least two. The team can have 1, 2 or 3 students.

3. I have graduated from a college and am currently not a student. Can I participate?

No. Only people with a valid Pragyan ID and who are college students can participate in the event.

4. How many entry per team?

Only one entry per team.

5. What all design software can be used and is a software compulsory?

Any design software (3DsMax, Catia, Pro-E, Rhino, Alias and Solid Works only) or hand drawn sketches may be used for the presentation.

6. What is the maximum duration of the presentation?

The duration of presentation is not to exceed 5 minutes for Phase II.

RESOURCES :

www.carbible.com

www.cadlearning.com

Wikipedia/powertrain,dampers

<http://www.slideshare.net/harshgupta161/kinetic-energy-recovery-system-kers>

Wikipedia/automotive design

WWW.PRAGYAN.ORG
LET'S CELEBRATE TECHNOLOGY

PRIZE MONEY : Worth INR 22,000

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