



(PROBLEM STATEMENTS)
(Department of Mechanical Engineering)

PROBLEM 1:

DESIGN AND MANUFACTURING OF EASY ACCESSIBILITY RAMP IN PUBLIC TRANSPORT FOR HANDICAPPED PEOPLE.

Problem identification - INACCESSIBLE INDIA

Abstract- As we all know that a large population of India is mainly dependent on public transport for travel purposes, yet it's sad to say that a group of people doesn't get access to these facilities because this group of people was ignored during designing of these transport vehicles. We are talking about physically handicapped and old age peoples who cannot climb the steep stairs of trains and buses though government of India have tried some measures but none of them seems to be efficient enough to be adopted nationwide, some of them are time consuming and some are just too complicated for people to use.

Problem objective-

Study the designs of most commonly used Indian city buses and also the new buses being bought and suggest a handicap ramp access that can be installed in these buses to make them better accessible for wheelchairs.

Suggest a detachable ramp design that can be quickly attach and act as a access path for wheelchairs for train coaches and then as quickly be detached.

Expected outcome-

In the above problems the following are need to be kept in mind

1. Ramp needs to be strong and stable enough to support a person on wheelchair and a companion minimum 200kgs weight resistant.
2. Minimalistic time delay to be caused by operation of ramp.
3. Easily usable so that a bus conductor or station worker can operate it.

PROBLEM 2:

DESIGN AND MANUFACTURE SURVEYING DRONE/BOT

Abstract- Police and rescue forces often find themselves in raids and emergency operations that require them to enter unknown buildings/structures which may present many danger to them such as hidden explosives, hazardous environment etc. also archaeologists and adventurers while exploring new historic places often find themselves in caves, forts etc. inside which gas build ups and waste deposits.

Problem objective-

Design and make a surveying robot/drone that can survey and map building structures, caves, forests abandon forts etc and transmit data to create a virtual 3-D model of these places.

Expected outcome-

1. The robot/drone need to be robust and versatile enough to travel over uneven surfaces or in moist and rainy conditions .
2. It should have sensors to note other parameters such as air composition, temperature, humidity etc.

PROBLEM 3:

RE-DESIGNING AMBASSADOR AS A SYMBOL OF OFFICIAL CAR OF INDIA

Problem objective-

The ambassador car has become a symbol of vehicle for prominent officials in INDIA. study the design of ambassador car and enhance the vehicles performance and safety while keeping the look of the car similar. You can change entire interior as well as its parts the only constant must be that the car should look similar in design.

Expected outcome-

1. The designed vehicle must be bullet proof and should have multiple fail safe systems in cases of emergency.
2. The vehicle must have 'BS4' vehicle compliance.
3. Vehicle should be comfortable from inside.

PROBLEM 4:

RE-DESIGN NANO AS POLICE PATROLLING VEHICLE

Problem objective-

Indian cities have small width roads and a major area crunch in big and populated cities. It makes police patrolling difficult. NANO as such proved out to be a good compact vehicle for navigating Indian streets but strength wise the car isn't exactly perfectly made to be a police patrolling vehicle. Suggest design changes to vehicle to improve it more as police patrol vehicle.

Expected outcome-

1. The vehicle should be enhanced for purposes such as community liaison car, traffic police car, patrol car.
2. It should be able to be outfitted with safety equipments such as AEDs(Automated External Defibrillator), first aid kits, fire extinguishers, flares, life buoys, barrier tapes etc.
3. It should have an audible and visual warnings.
4. It must have police specific equipments.
5. It must be able to transport one/two suspects or an injured person in case of emergency.

PROBLEM 5:

BOMB DIFFUSAL BOT

Problem identification- Dangers involved in bomb diffusion incidents.

Abstract- Bomb disposal is quiet a dangerous task and may often result as a deadly task therefore lets design a bot that allows the bomb disposal personnel's to interact and diffuse

bomb without being in the blast radius of the bomb in this way the task of bomb disposal will become a much safer process for security forces.

Problem objective-

For use of security forces, design a multi-utility robot for purpose of surveillance , detection and diffusion of IED/BOMB/Landmines when infiltrating a building. Key focus should be on-

Expected outcome-

1. Low maintenance.
2. Price should be kept in check(it should be in practical limit of purchase of all state police forces)
3. Should be able to maneuver inside a building wirelessly on battery operation for about 30mins to 1hour Along With multiple methods of wireless connectivity
4. Robust design for operation under extreme circumstances.
5. Easy and quick to transport between different sites in case of emergency.

PROBLEM 6:

DESIGN AND MANUFACTURING OF IED DETECTION SYSTEM MOUNTABLE ON POLICE JEEPS

Abstract- While patrolling in naxalite regions police contingent are prone to attacks by hidden IED's in their path and with this problem we are trying to find solution for the same.

Problem objective-

Design an IED detection system that can be mounted on police jeeps to detect IED'S within a 20 meter radius of the vehicle and warn driver of hidden IED'S in path of vehicle

Expected outcome-

1. The system should contain a fail safe feature of stopping vehicle if the driver fails to respond.
2. It should be cost effective.
3. Should be operatable in all climate conditions
4. Should be military grade shock and water proof

PROBLEM 7:

COOLING SYSTEM FOR SLEEPER COACHES OF INDIAN RAILWAYS PASSENGER/EXPRESS TRAINS

Problem objective -

Study the current ICF design railway coaches and suggest cheap and affordable cooling solution for sleeper coaches such as readjustment of fan positions , provisions of better ventilating system etc.

Expected outcome-

1. Solution should be affordable at a large scale.
2. Shouldn't add burden of cost on commuters.
3. Compatible with current design railway coaches.