Roll no:- 2150.

Modern College of Engineering
Shivajinagar, Pune 5.

Div-B3

Name :- Vaibhav Atmaram Padghan

Assignment - 3.

Aim :- Assignment on electric vehicle specifications and its systems.

1] What is electric vehicle ? What is the need of electric vehicle?

Ans.

i) The electric vehicle is any vehicle that uses electric motors for propulsion, while electric car generally refers to highway-capable automobile powered by electricity.

ii) Why we need electric vehicle :-

a) Increasing transportation efficiency is the best place to start efforts to reduce emissions of carbon dioxide (CO_2) which is a primary culprit in global warming

b) of all CO_2 emissions, about 33% comes from transportation.

c) With gasoline-electric hybrid power and all-electric power, we can achive significant cost and environmental savings,

d) In fact, even if we switched from gasoline cars to EVs and plug-in hybrids recharged by our existing utility grids (which mostly use fossil fuels), we would see a 42 percent national average reduction in CO_2 emission.

Hence, we need a electric vehicle?

Q.2. Explain the working principle of electric vehicle.

Ans.

Working Principle :-

i) All electric vehicles (EVs) have an electric motor instead of an internal combustion engine

ii) The vehicle uses a large traction battery pack to power the electric motor and must be plugged in to a charging station or wall outlet to charge.

iii) Because it runs on electricity, the vehicle emits no exhaust from a tailpipe and does not contain the typical liquid fuel components, such as a fuel pump, fuel line or fuel tank.

iv) They don't require any type of fossil fuels, no exhaust, no more dust particles in air.

In this way, the electric vehicles work.

3] Explain the different types of electric vehicles.

Ans. There are three main types of electric vehicles (EVs). Classified by the degree that electricity is used as their energy source, BEVs are battery electric vehicles. PHEVs of Plug-in hybrid electric vehicles. only BEVs are capable of charging on a level 3, DC fast charge.

i) Battery Electric vehicles (BEV).
- a) Battery electric vehicles, also called BEVs, and more frequently called EVs, are fully electric vehicles.
- b) with rechargeable batteries and no gasoline engine.
- c) (BEVs) store electricity onboard with high-capacity battery packs.

ii) Plug-in Hybrid Electric vehicle (PHEV).
- a) Plug-in Hybrid Electric

vehicles or PHEVs can recharge the battery through both regenerat-ive braking and 'plugging in' to an external source of electric power.

b) While 'standard' hybrids can (at low speed) go about 1 - 2 miles before the gasoline engine turns on.

c) PHEV models can go anywhere from 10-40 miles before their gas engine provide assistance.

iii) Hybrid Electric Vehicles (HEV)

a) Hybrid electric vehicles or (HEVs) are powered by both gasoline and electricity.

b) The electric energy is generated by the car's own breaking system to recharge the battery.

c) This is called regenerative breaking, a process where the electric motor helps to slow the vehicle and uses some of the energy normally converted to heat by the brakes.

Q. No. 2

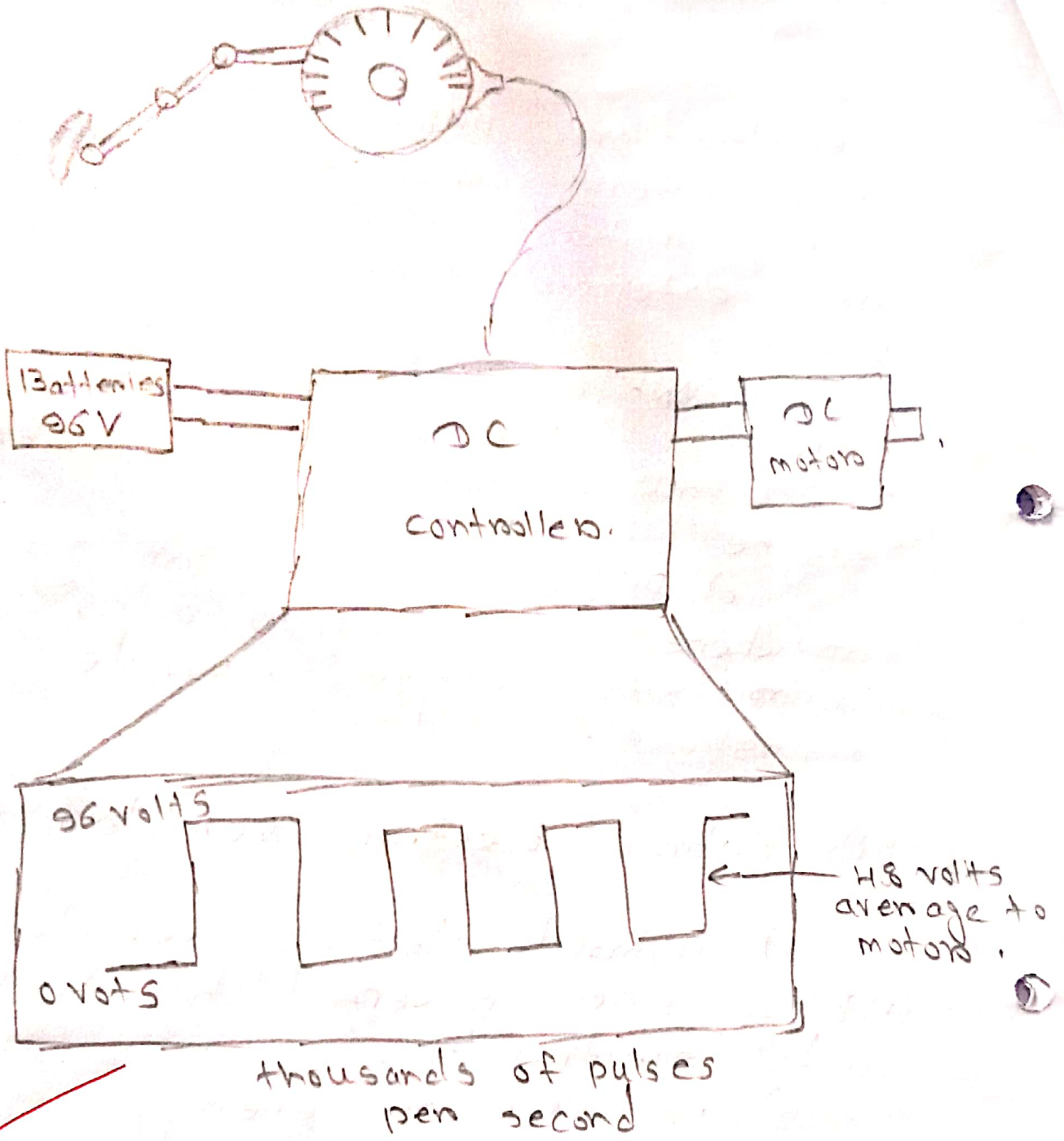

Fig - inside an electric car.

4] What are the advantages and disadvantages of electric vehicles?

Ans. Advantages :-

i) Doesn't depend on fossil fuels for your commutation.
ii) Electric vehicles are known for their always-on power delivery.
iii) Electric vehicles are silent operators.
iv) Running on electricity means good bye to exhaust gases. Say hello to clean air.

Disadvantages :-

i) Priced (30-40)% higher than their regular counterparts.
ii) Charging infrastructure is not adequate.
iii) Drive range offered by battery technology is not adequate.
iv) Battery packs that powers them are highly susceptible to wear and tear and expensive.

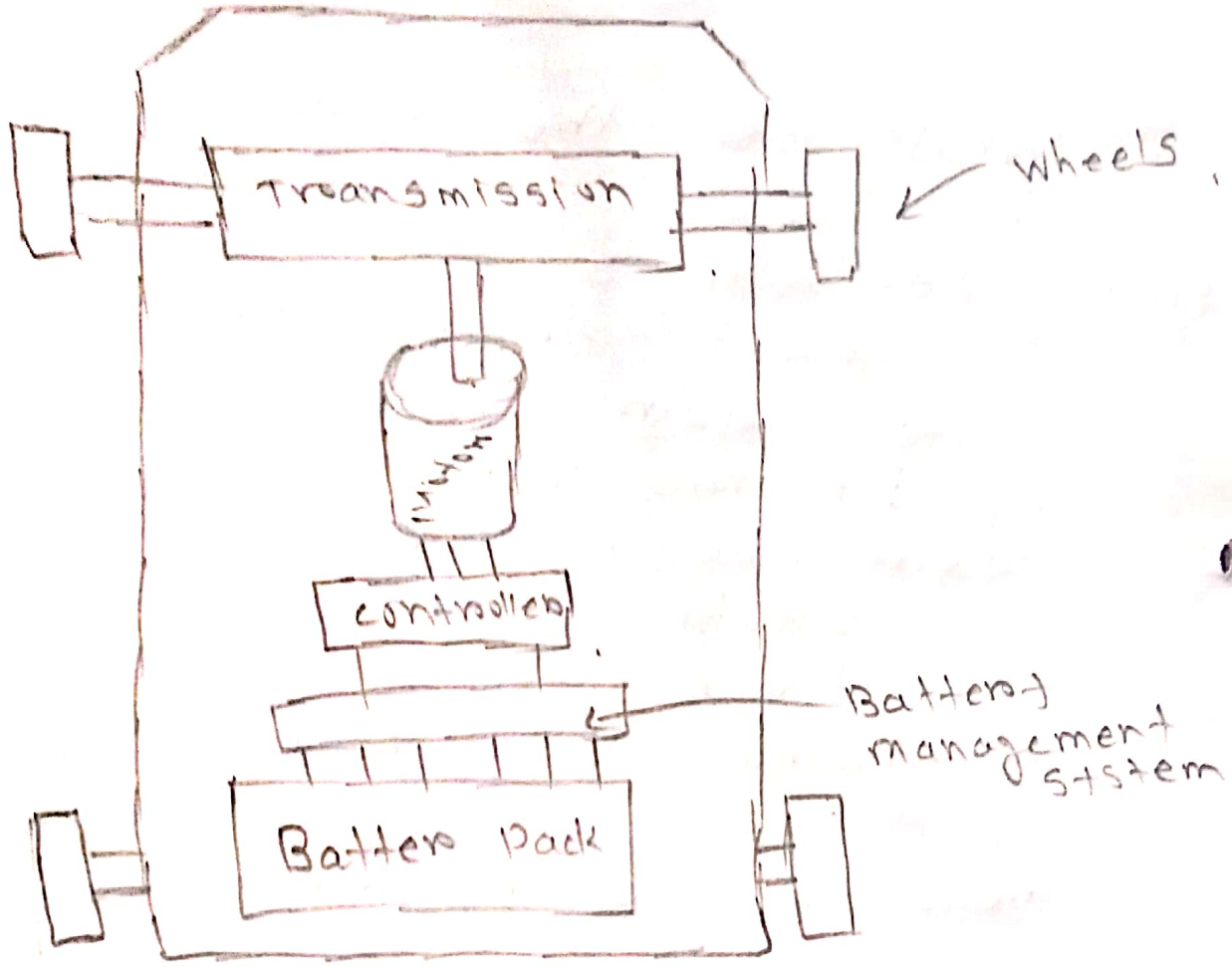

Fig. Electric vehicle.

Modern College of Engineering
Shivajinagar, Pune 5.

5] Explain the Indian electric vehicles scenario.

Ans.

i) India is a coal driven country, so most electricity required for EVs is supplied from thermal plant.

ii) Two wheelers are seen more on road, due to its fuel efficiency. India is 2nd largest 2W market after China and will remain the preferable till 2035.

iii) People in India are more concerned about the mileage, maintenance free, durable, immediately accessible and service oriented vehicles.

iv) Market of EV in India is about 1% over the decade.

v) Indian government has released its 'National Electric Mobility Mission Plan' (NEMMP 2020) in 2013, which aims to deploy 4 lakh passenger BEV's on road by 2020.

This was the scenario of electric vehicles in India.