Assignment -1

1672 – Inventeon of the first steam powered vehicle.

1769 – Steam powered automobile, human transportation

1826 – First EV and IC engine

1886 – Large scale production of EV.

1890 – Motorised carriage was invented by William morrison

1906 – Advanced EV

1910 – EV started declining

1967 – California Air resource Board established.

1991 – (Low emission vehicle program)

2003 – LEV 2 introduced. LEV – 10-15% less emission
ULEV – 20-80% less emission
PZEV – 0 % emission

2006 – Tesla roadster introduced.

2010 – first affordable EV, mission leaf introduced.

(a) invention of electric motor

The first commutated DC electric motor capable of turning machinery was invented by British Scientist William Sturgeon in 1832.

① Golden era of EV.

Early 1900s was known as the golden era of EVs. During golden age of EV, they made up more than 1/3rd of the car sales in US.

② Domination of EV by Gasoline Cars.

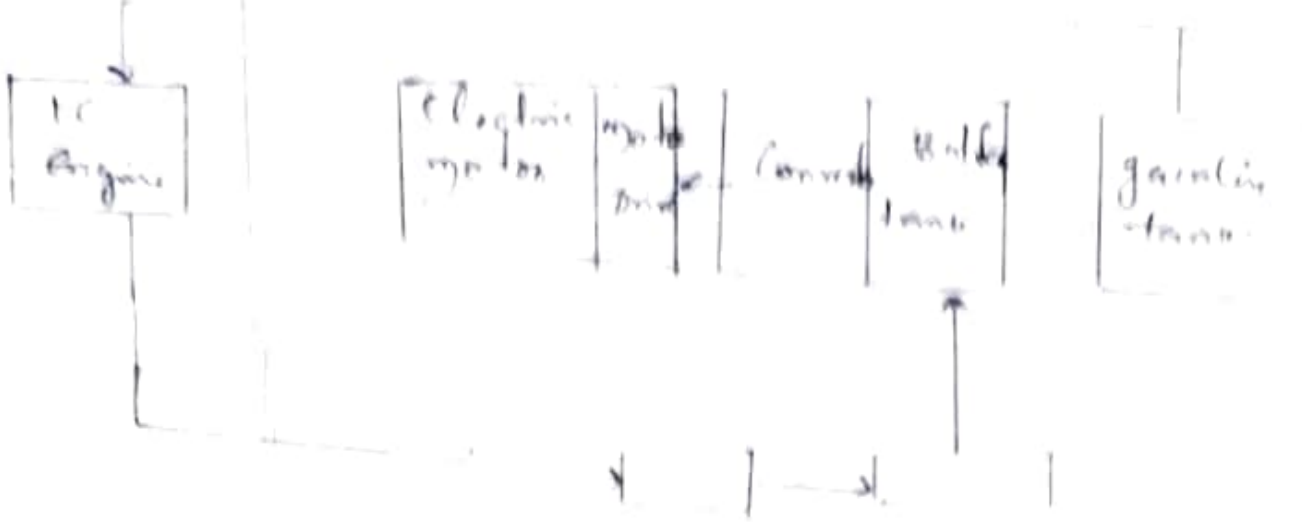
Gasoline cars started dominating after the invention of assembly line production of IC engines.

③ Coming of new era in EV

New era of EV was started with CARB.

④ Introduction of hybrid vehicles

Started a new era in the vehicle market, more and more efficient than other vehicles



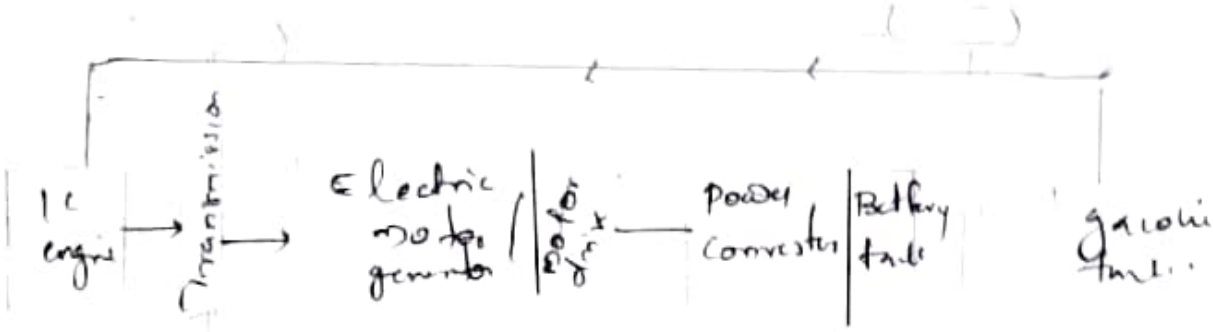
Advantages:

- Smaller and efficient engine
- reduces harmful gas emission

Disadvantages:

- requires a package with smaller power ratings
- no of energy conversion result in loss

Parallel hybrid Vehicle

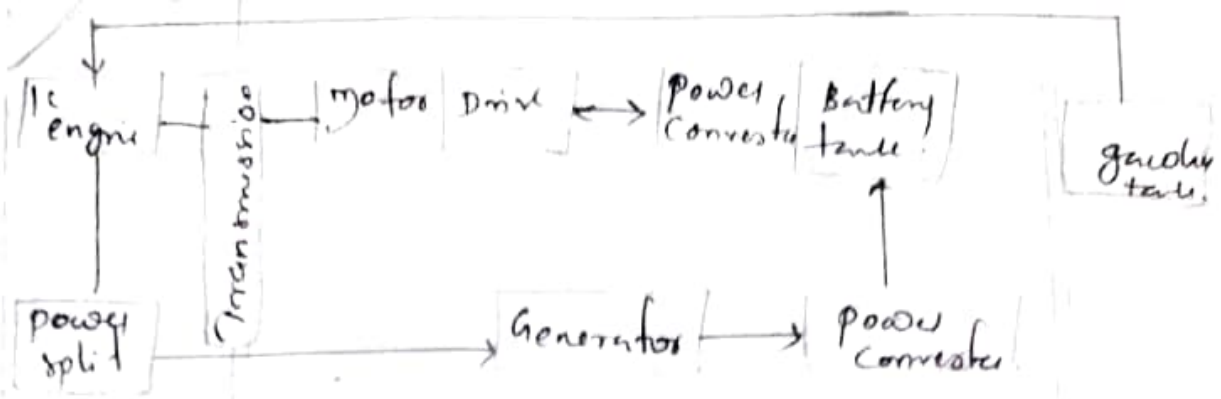


Advantages:

- Uses smaller battery packs relying on regenerative braking
- engine noise less

Disadvantages

- high cost
- high weight



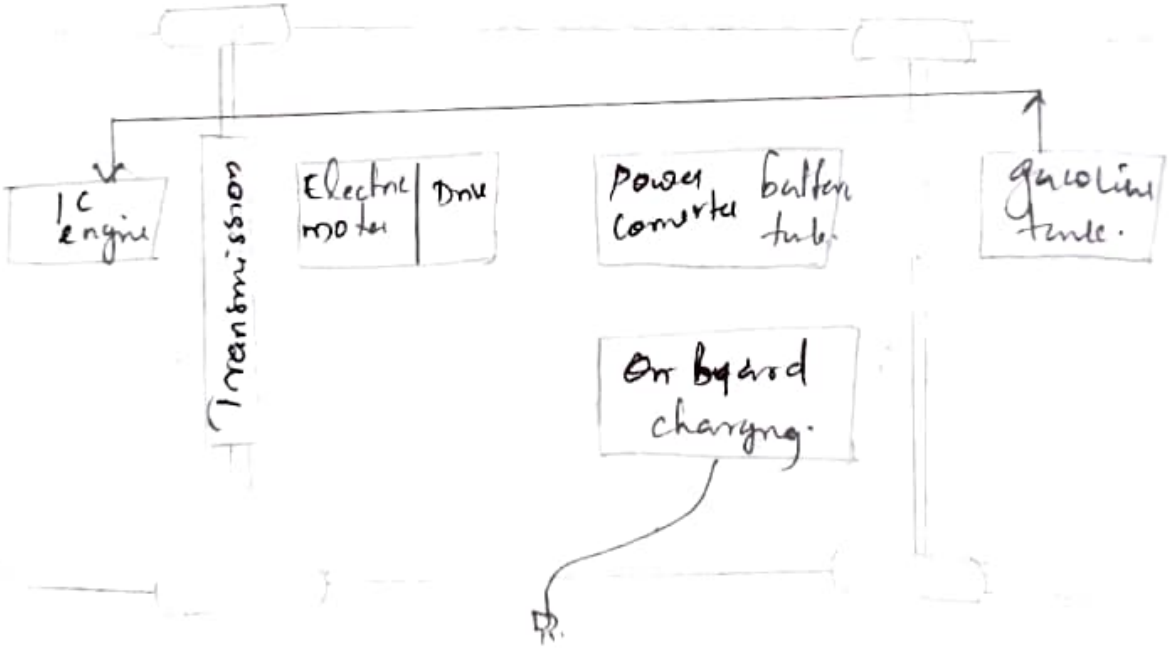
advantages :-

High efficiency

Disadvantages.

→ high cost
→ larger battery, motor & generator.

Plug-in hybrid EV



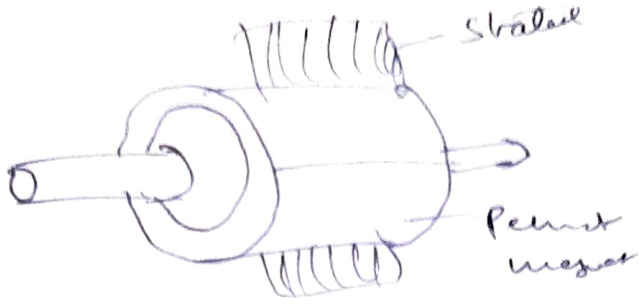
Advantages

→ less green house gas emission.
→ low fuel cost

Disadvantages.

→ Recharging taking time
→ higher vehicle cost

(3) BLDC motor



Construction and working principle

BLDC motor works on the principle similar to that of a Brushed DC motor - The lorentz law, which states that whenever a current carrying conductor placed in a magnetic field experiences a force as a consequence of force, the magnet experience an equal and opp force

In BLDC, current carrying conductor is stationary & permanent magnet is moving.

when stator coils get supply from source, it becomes electromagnets and starts producing the uniform field in the air gap.