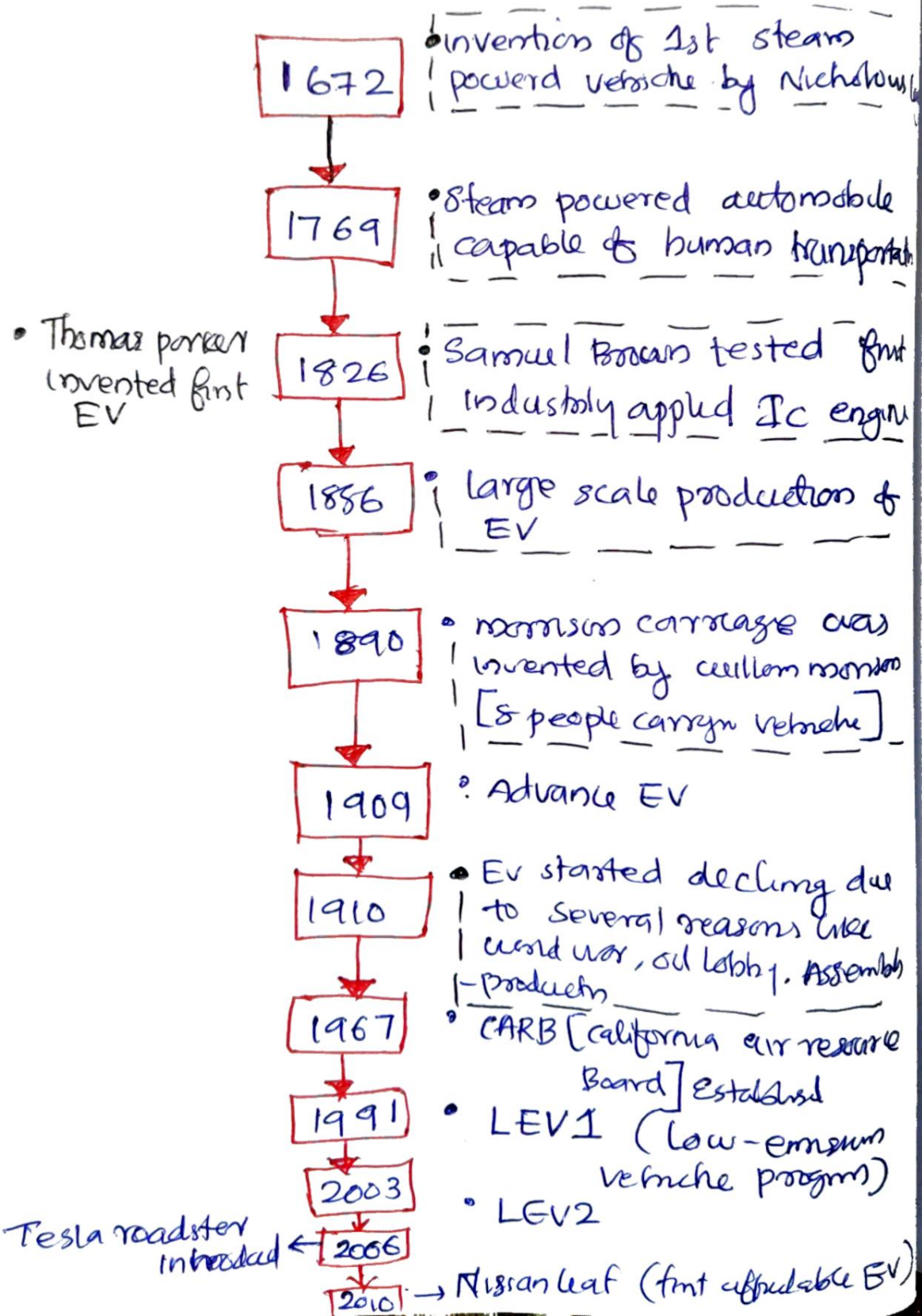
Q1 :- Explain the Journey of Automotive.



(a) invention of Electric motor

The first commutator DC electric motor capable of turning machinary was invented by British scientist william sturgeon in 1832

(b) Golden Era of Ev

Early 1900s was known as the golden Era of Evs. During Golden age of Ev, they made up more then 1/3rd of the car sales in US

(c) Domination of Ev by Gasoline cars

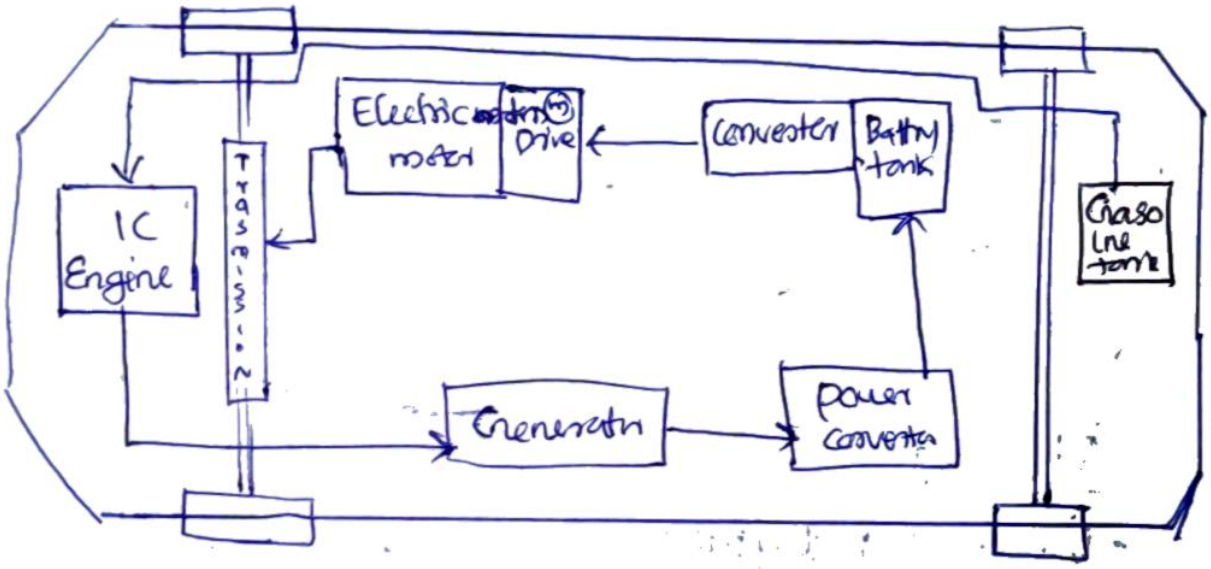
Gasoline cars started dominating after the invention of assembly line production of Ic Engine which helps to decreases the price of engines in terms reduce in the overall price of the Gasoline vehicle. And the self starting mechanism of Ic Engine (1912) also boosted them.

(D) Coming of New Era of Ev

New era of Ev was started with CARB. CARB adopted LEV1 and LEV2 programs which Enhance the Ev production

Q 2

(1) SERIES HYBRID VEHICLE



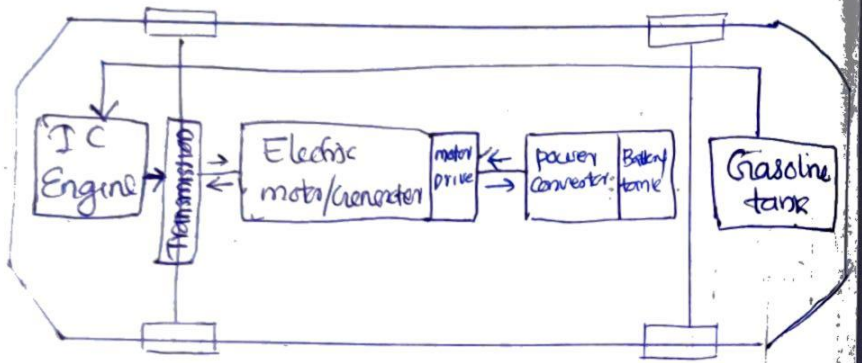
Advantage

- Smaller and effient Engine
- reduces harmful gas emsn

Disadvantage

- require 3 machines with similar power rating
- No of Engine crank result in Less

(2) PARALLEL HYBRID VEHICLE



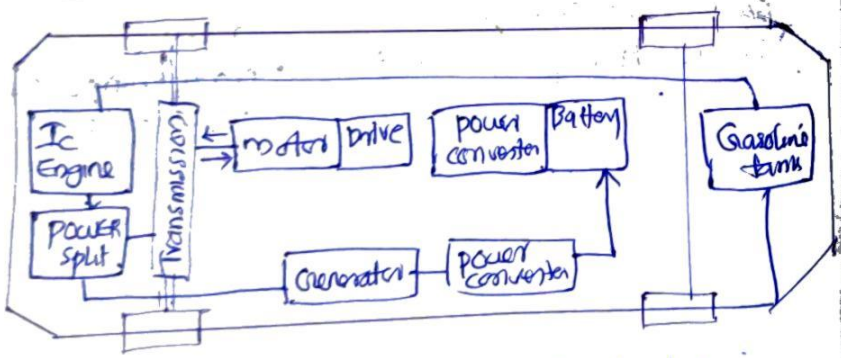
Advantage

- Use Small Battery pack
- Regenerative breaking to recharge battery
- Engine noiseless

Disadvantage

- high cost
- high weight

(3) SERIES-PARALLEL HYBRID VEHICLE



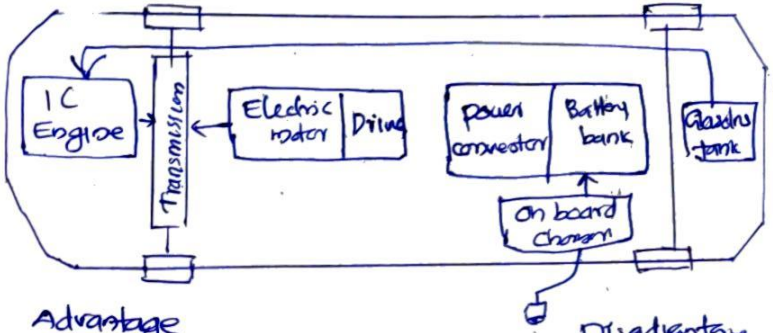
Advantage

high effiency

Disadvantage

- Larger battery
- motor & Generator

(4) PLUG IN HYBRID EV



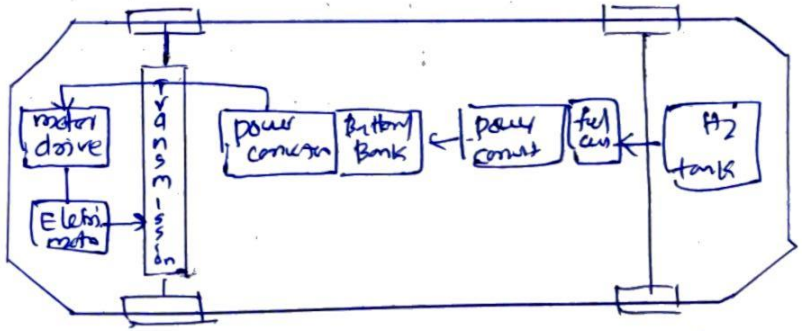
Advantage

- less green house gas emission
- Low fuel cost

Disadvantage

- Recharging takes time
- Higher vehicle cost

(5) FUEL CELL EV



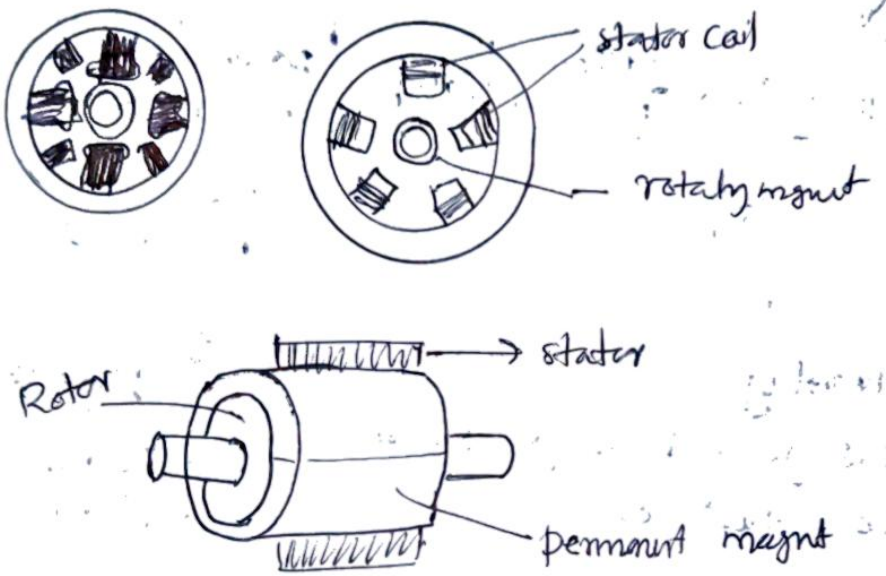
Advantage

- no harmful emissions
- Renewable & Readily available fuel

Disadvantage

- storage and transportation of hydrogen
- fuel cell efficiency

Q. BLDC motor



BLDC motor works on the principle to that of a Brush DC motor. The Lorentz law, which states that whenever a current carrying conductor placed in a magnetic field experience a force as a consequence of reaction force. the magnet will experience equal and opposite force in BLDC, current carrying conductor is stationary & permanent magnet is moving

when stator coil get supply from source it becomes electromagnet and start producing uniform field in the airgap. Through the source of supply is DC which make to

generate an AC voltage waveform with trapezoidal shape due to the force of interaction between electromagnet stator and permanent magnet rotor, rotor continues to rotate.