① Universal motor:-

Construction:- They are small capacity series motor which can be operated on DC supply or single phase AC supply of same voltage with similar characⁿ called universal motor.

- It is manufactured in two type:-
  (a) Non-compensated type, low hp
  (b) Compensated type, high hp poles
- Non-compensated type motor has 2 poles, having entire magnetic path is laminated.

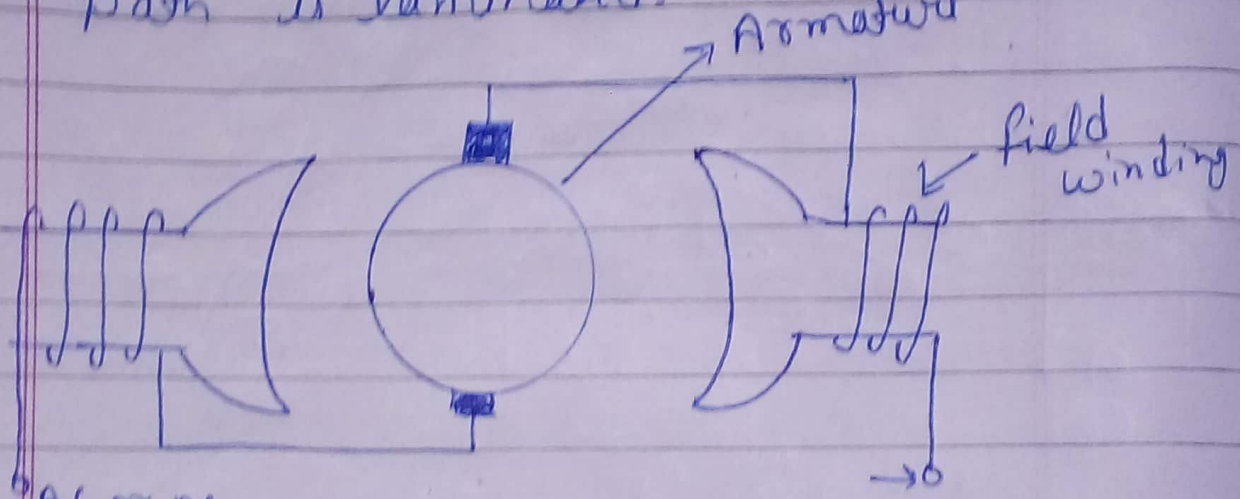
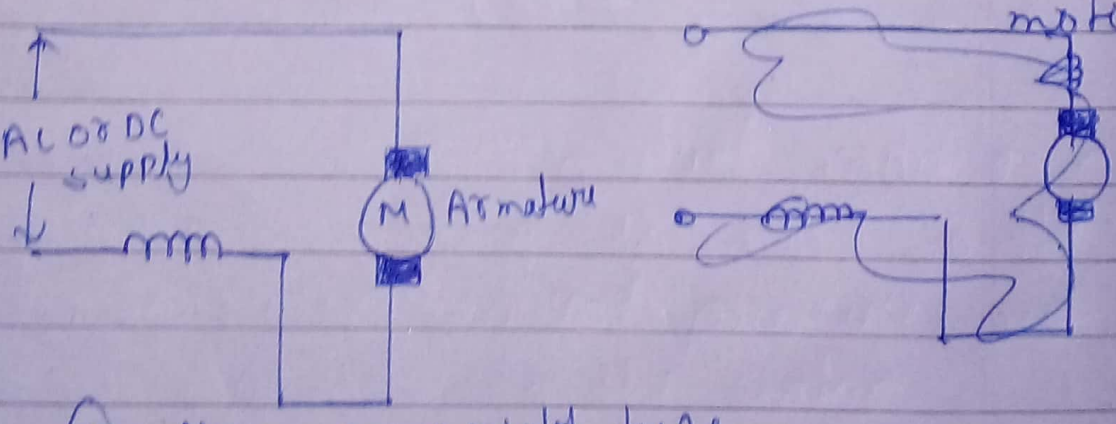
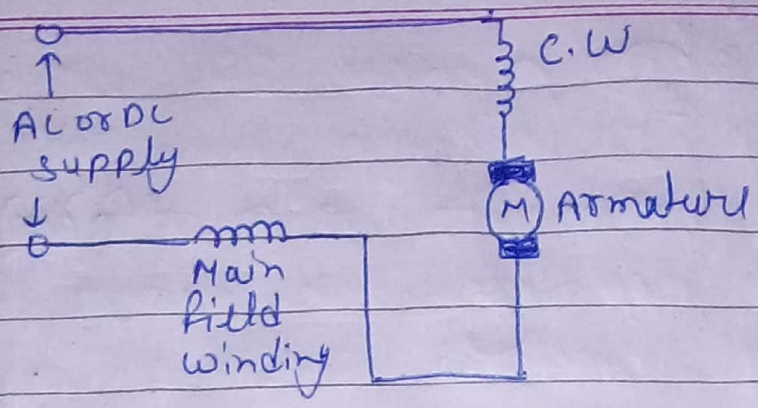


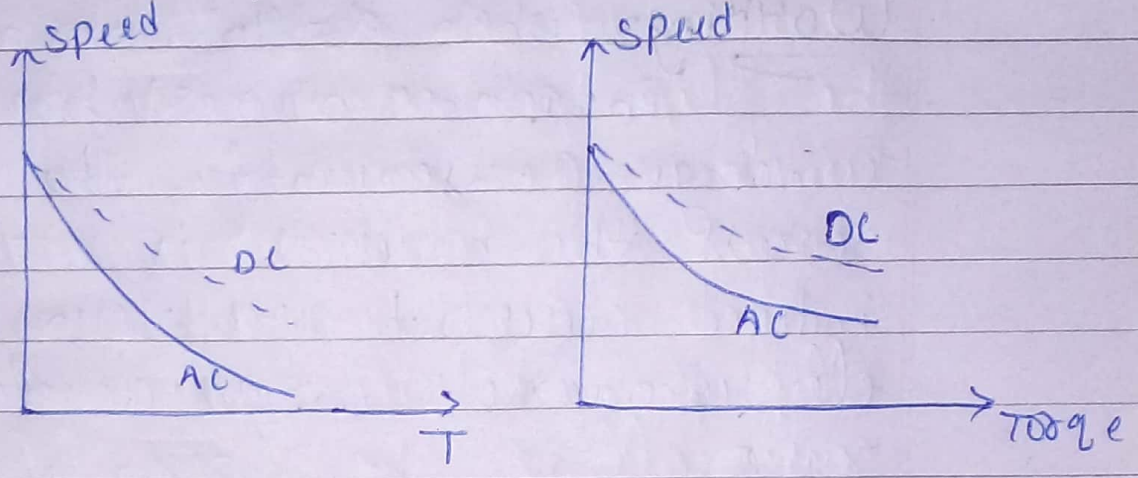
Fig - ① Cross-section of non-compensated universal motor



(a) Non-compensated type



speed - torque characteristics



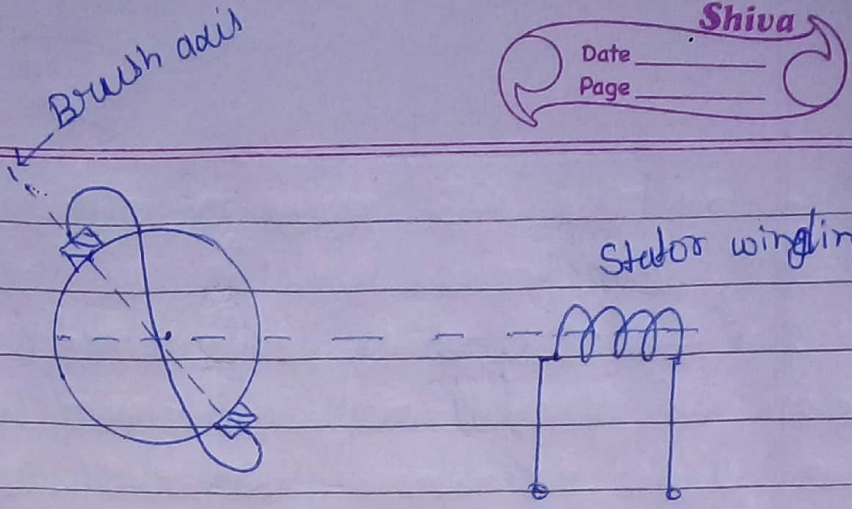
(a) Non-compensated type

(b) compensated type

Repulsion motor- It is a special kind of single-phase AC motor which works due to the repulsion of similar poles.

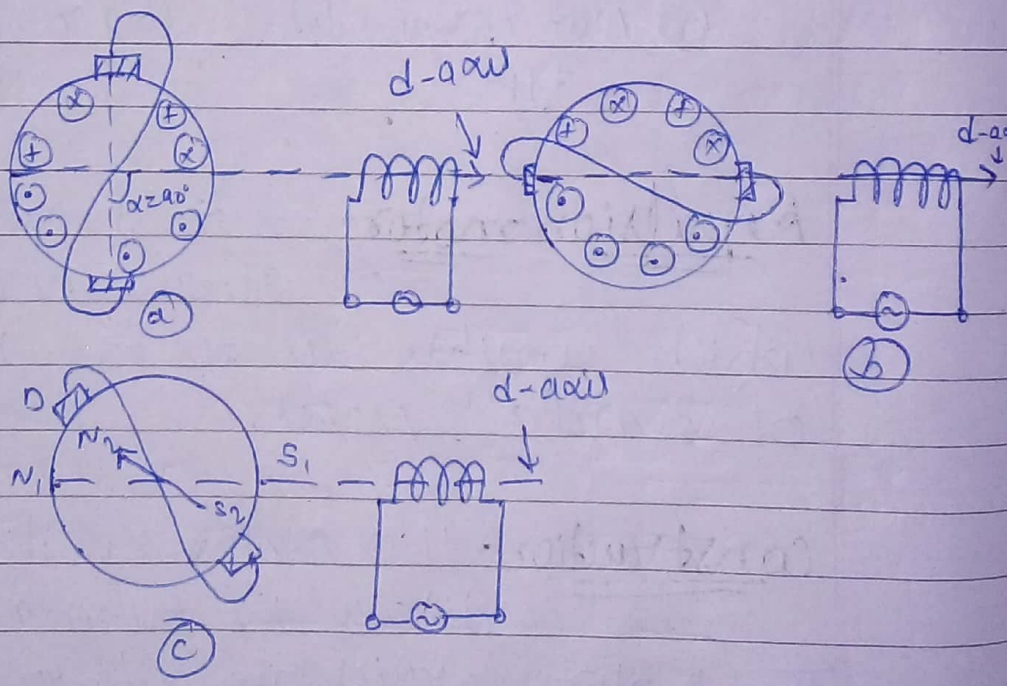
Construction- The stator of this motor carries a 1ϕ exciting winding. The rotor carries an ordinary distributed DC type winding, connected to the commutator at one end.

The brushes are S.C on themselves & are not connected directly to the supply ckt.



repulsion motor

Working- When $\alpha = 90°$, no mutual inductance b/w stator & rotor windings. Consequently, the voltage across the brushes is zero, rotor induced current are zero hence electromagnetic torque developed is zero.



when $\alpha = 0°$, the mutual inductance b/w two winding is max, so the large rotor current produce rotor mmf opposite to the stator.

Then when $\alpha = 0^\circ$ or 90° motor is not in running position but when $\alpha \neq 0$ (or $\alpha \neq 90^\circ$), due to net induced voltage, electromagnetic torque is produced & rotor runs.

characteristics -