PHYSICS - X-PART-03 CLASS 21

Stages of rotation of an armature coil while completing one rotation in a magnetic field

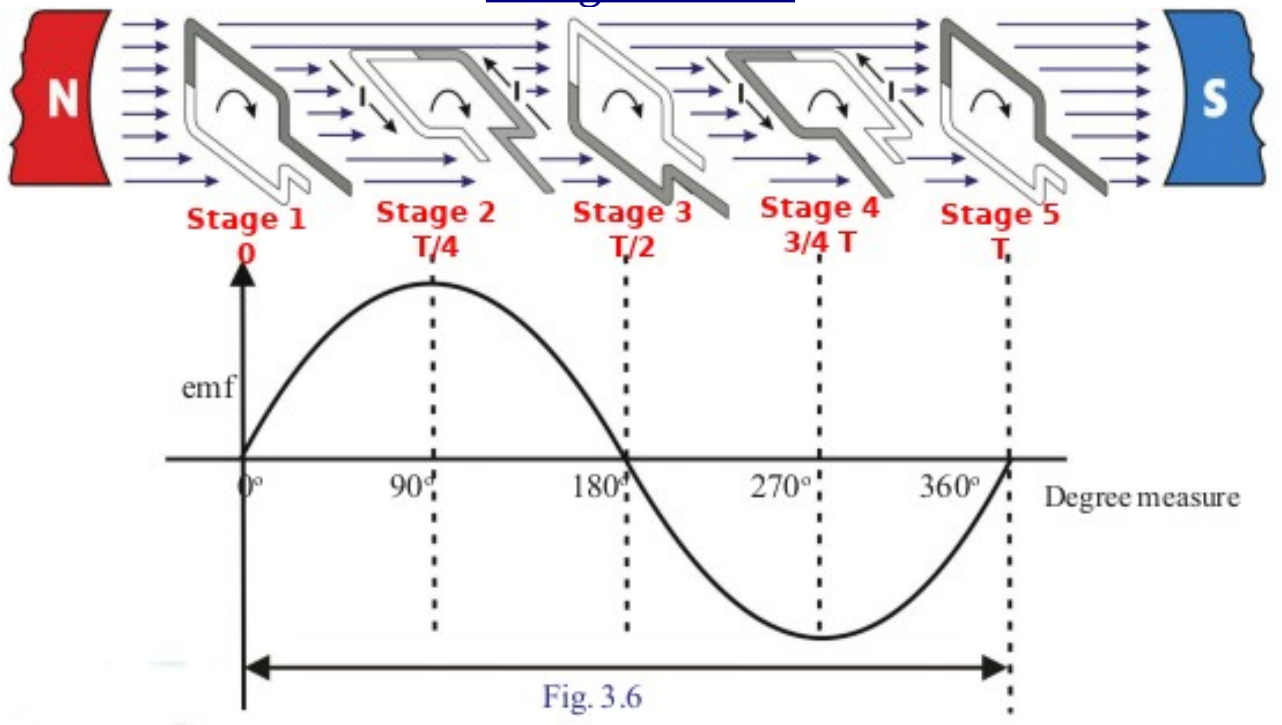


Fig. 3.6

Stage 1 (angle of rotation 0 ,Time 0)

- The plane of armature coil is perpendicular to the direction of magnetic field.
- The rate of change of Flux is zero.
- Induced current in the coil is zero.

Stage 2 (angle of rotation 90 ,Time T/4)

- The plane of armature coil is parallel to the direction of magnetic field.
- The rate of change of Flux is maximum.
- Induced current in the coil is maximum.

Stage 3 (angle of rotation 180 ,Time T/2)

- The plane of armature coil is perpendicular to the direction of magnetic field.
- The rate of change of Flux is zero.
- Induced current in the coil is zero.

Stage 4 (angle of rotation 270 ,Time 3/4T)

- The plane of armature coil is parallel to the direction of magnetic field.
- The rate of change of Flux is maximum in the opposite direction.
- Induced current in the coil is maximum in the opposite direction.

Stage 5 (angle of rotation 360 ,Time T)

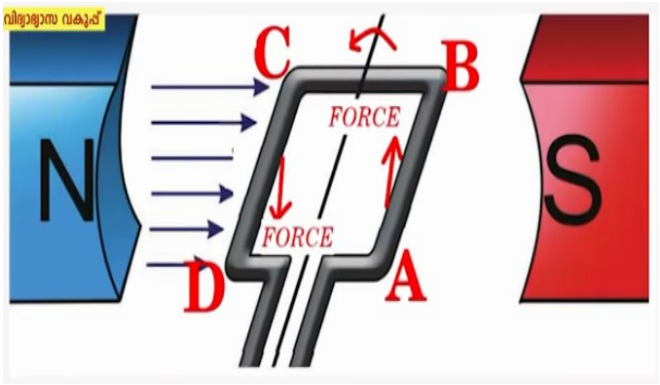
- The plane of armature coil is perpendicular to the direction of magnetic field.
- The rate of change of Flux is zero.
- Induced current in the coil is zero.

	Time				
	0	T/4	T/2	¾ T	T
Angle of rotation of the armature.	0^0	90^0	180^0	270^0	360^0
Rate of change of flux.	0	maximum	0	maximum in opposite direction	....0..
Induced emf in volts V.	0	maximum	0	maximum in opposite direction	....0..

Period T

The time taken by the armature coil for a full rotation is called the period, T.
Time taken for half rotation (180^0) is T/2.

Assignment



* Find out the direction of current in the parts AB and CD of the coil ABCD if the coil is in a closed circuit.