# SNS COLLEGE OF ENGINEERING

Kurumbapalayam (Po), Coimbatore – 641 107

**An Autonomous Institution**

Accredited by NBA – AICTE and Accredited by NAAC – UGC with 'A' Grade
Approved by AICTE, New Delhi & Affiliated to Anna University, Chennai

## DEPARTMENT OF ELECTRICAL AND ELECTRONICS ENGINEERING

COURSE NAME : **23EEB201 THEORY OF DC MACHINES AND TRANSFORMERS**

II YEAR / 03 SEMESTER EEE

Unit 2 – DC Motor

# Construction of DC Motor

# Can You Guess?

- What is This?
- Where we are using?
- For What we have to use?
- When we have to use?

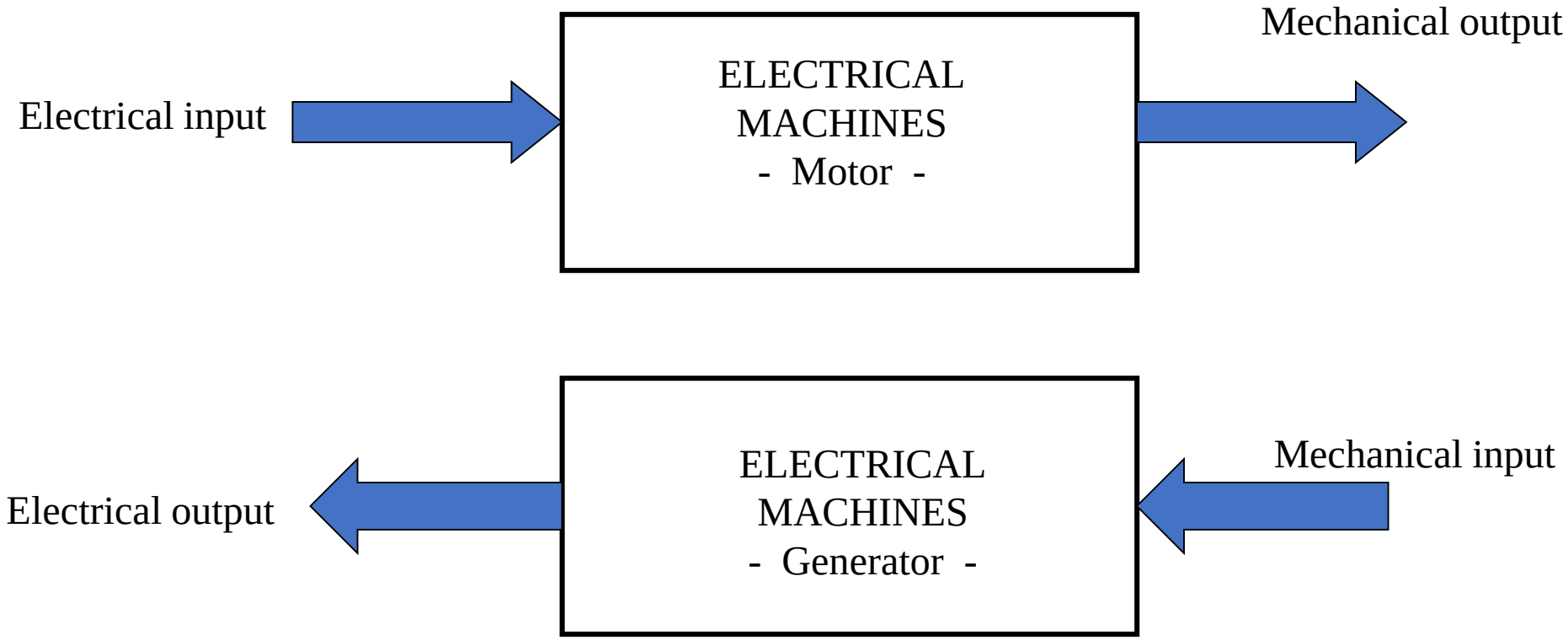
# Rotating Electrical Machines

- These can be divided into:

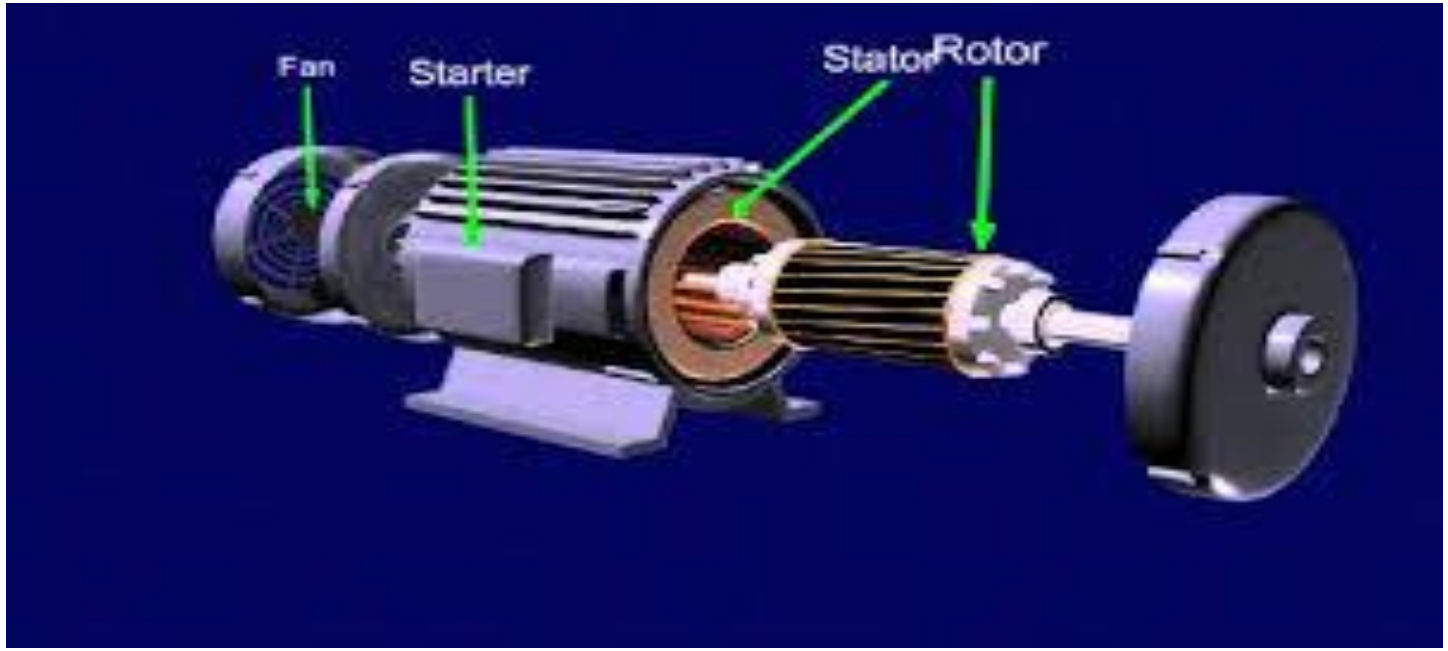
  **Generators** – which convert mechanical energy into electrical energy

  **Motors** – which convert electrical energy into mechanical energy

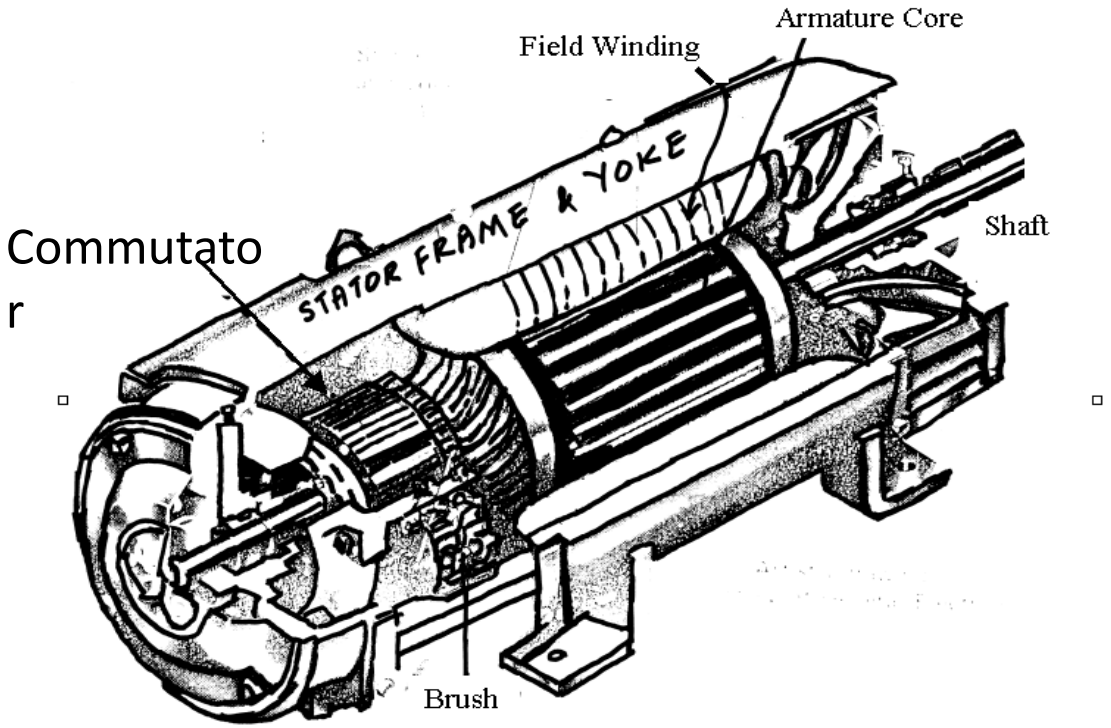
- Both types operate through the interaction between a *magnetic field* and a set of *windings*


Electrical input
ELECTRICAL MACHINES
- Motor -
Mechanical output
Electrical output
ELECTRICAL MACHINES
- Generator -
Mechanical input

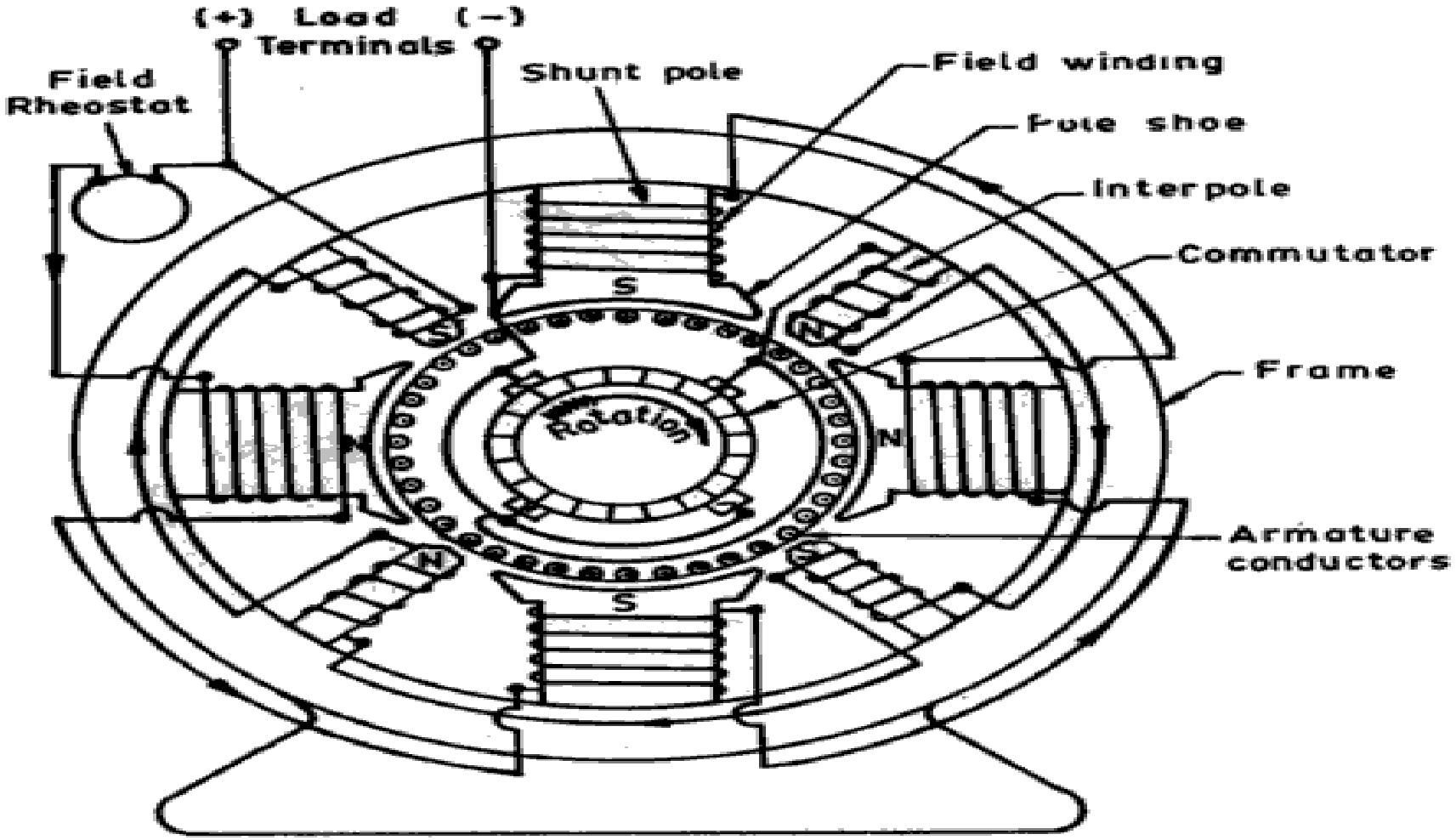
# DC Machine



# DC Machine

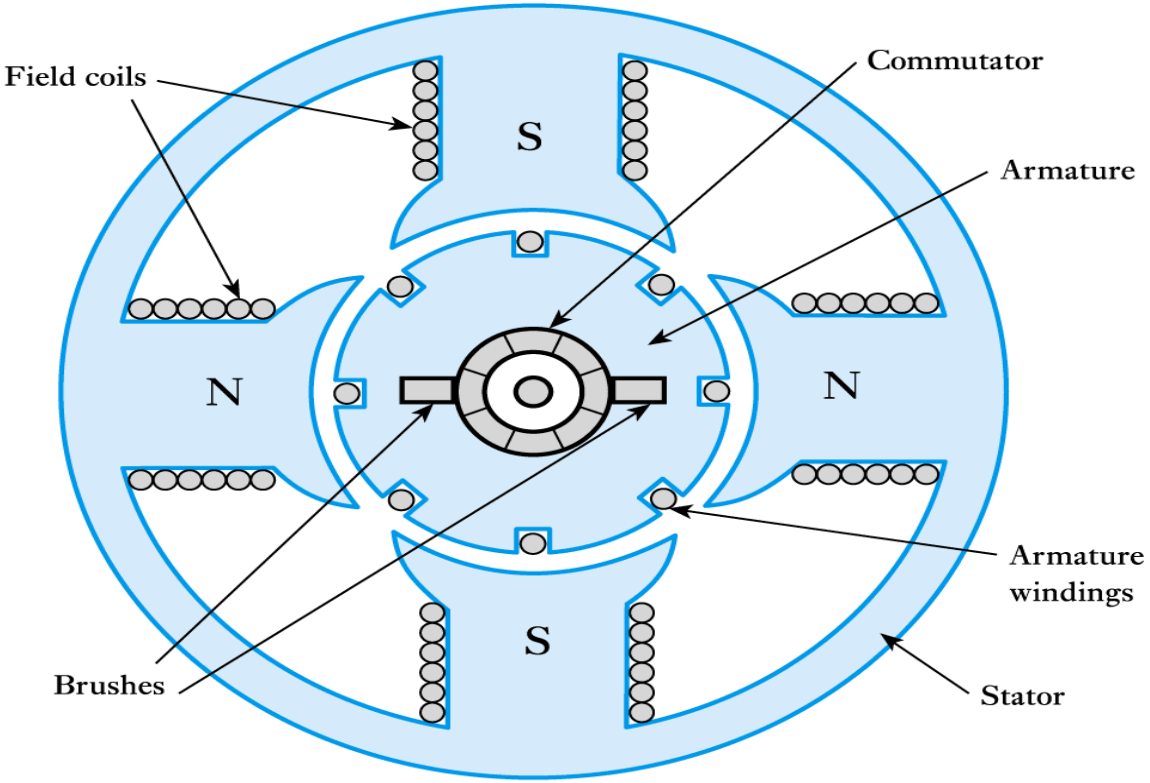

Armature Core
Field Winding
STATOR FRAME & YOKE
Shaft
Commutato
r
Brush

# Sectional view of a DC machine



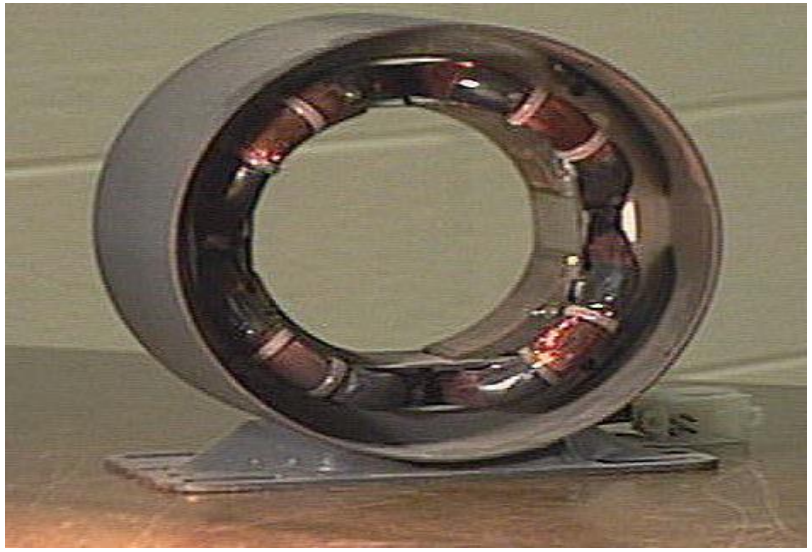
# Construction of DC Machine

- Field system
- Armature core
- Armature winding
- Commutator
- Brushes



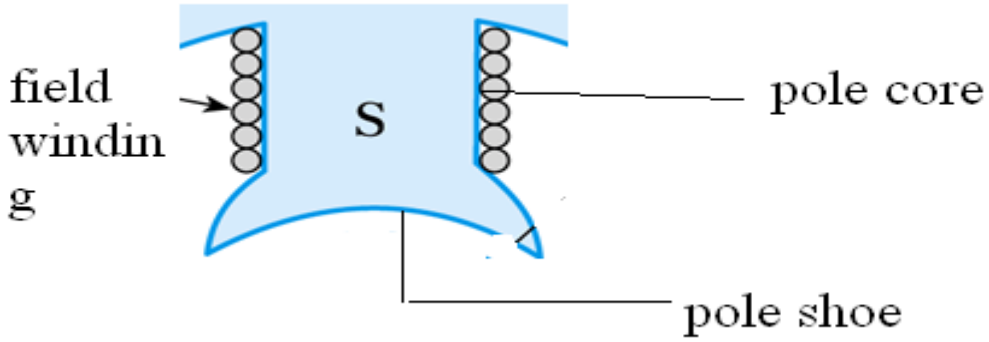
## Yoke:

- ✓Provides mechanical support
- ✓Carries magnetic flux
- ✓Made up of cast iron



## Field system:

- ✓Poles & field winding
- ✓Made up of Electromagnets



## Inter poles

- ✓Placed b/w main poles
- ✓Used for improving commutation

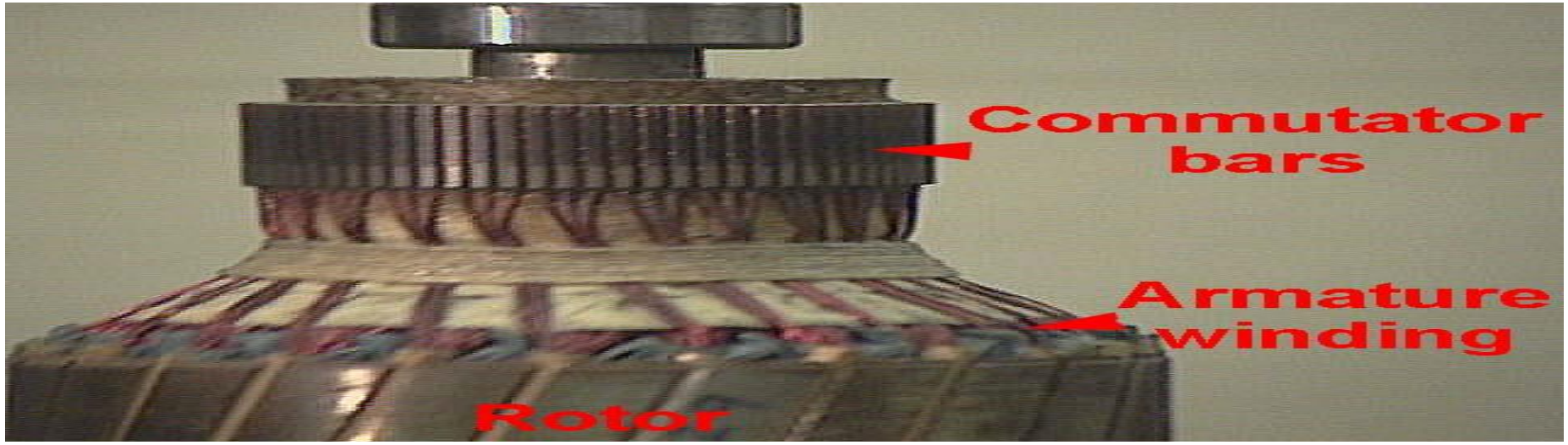
## Field winding:

- ✓Placed on pole core
- ✓Carry the current and produces the magnetic flux

## Armature :

- ✓Armature core –mounted on shaft & is cylindrical
- ✓Armature winding-emf is induced in armature conductors
- ✓Winding is made up of copper
- ✓High permeability silicon steel  stampings
- ✓Lamination is to reduce the eddy current loss

# Rotor and rotor winding




## Commutator

- ✓Emf induced is alternating
- ✓To convert AC into DC
- ✓Cylindrical in shape
- ✓Made of wedge shaped copper segments
- ✓Segments are insulated from each other
- ✓Each commutator segment is connected to armature  conductors.

## Brushes:

- ✓To collect current from commutator
- ✓Made up of carbon or graphite
- ✓Connected with external circuit

# Brush rock and holder

# Activity

Find the Ten Difference

# ASSESSMENT

1. **The Field coils of the DC generator are made up of ----?**

(A) Steel

(B) Copper

(C) Aluminum

(D) Iron

2. **The insulating material used between the commutator segments is normally**

(A) Graphite
(B) Paper
(C) Mica
(D) Insulating varnish

# REFERENCES


1. Murugesh Kumar K, “Electric Machines Vol I”, Vikas Publishing Pvt Ltd , (2010)
2. Gupta J.B,“ Theory and Performance of Electrical Machines”, S.K.Kataria and Sons, (2002)
3. Kothari D.P and Nagrath I.J“ Electric Machines”, Tata McGraw Hill Publishers, (2002)
4. Bhimbhra P.S., “Electrical Machinery”, Khanna Publishers, (2003)


## THANK YOU