# SNS COLLEGE OF TECHNOLOGY

**(An Autonomous Institution)**

**COIMBATORE-35**

**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: 19EEB201 DC Machines and Transformers

II YEAR / III SEMESTER

Unit 1 – DC Generator

Topic 3: EMF Equation of DC generator

# What We'll Discuss

**TOPIC OUTLINE**

EMF Equation

Assessment

# EMF Equation of a generator

Let

- $\Phi$ = flux/pole in Weber

- Z =Total number of armature conductors =No. of slot × No. of conductors/slot

- P= No. of generator poles

- A =No. of parallel paths in armature

- N= Armature rotation in revolutions per minute (r. p. m)

- E= e.m.f induced in any parallel path in armature

- Generated e.m.f $E_g$= e.m.f generated in any one of the parallel paths i.e E

Average e.m.f generated/conductor = $\dfrac{d\,\Phi}{dt}$ volt

Now, flux cut/conductor in one revolution $d\,\Phi = \Phi P$ wb

No. of revolutions/sec=N/ 60

$\therefore$ Time for one revolution , dt= 60 /N sec

According to Faraday's Law of electro magnetic induction

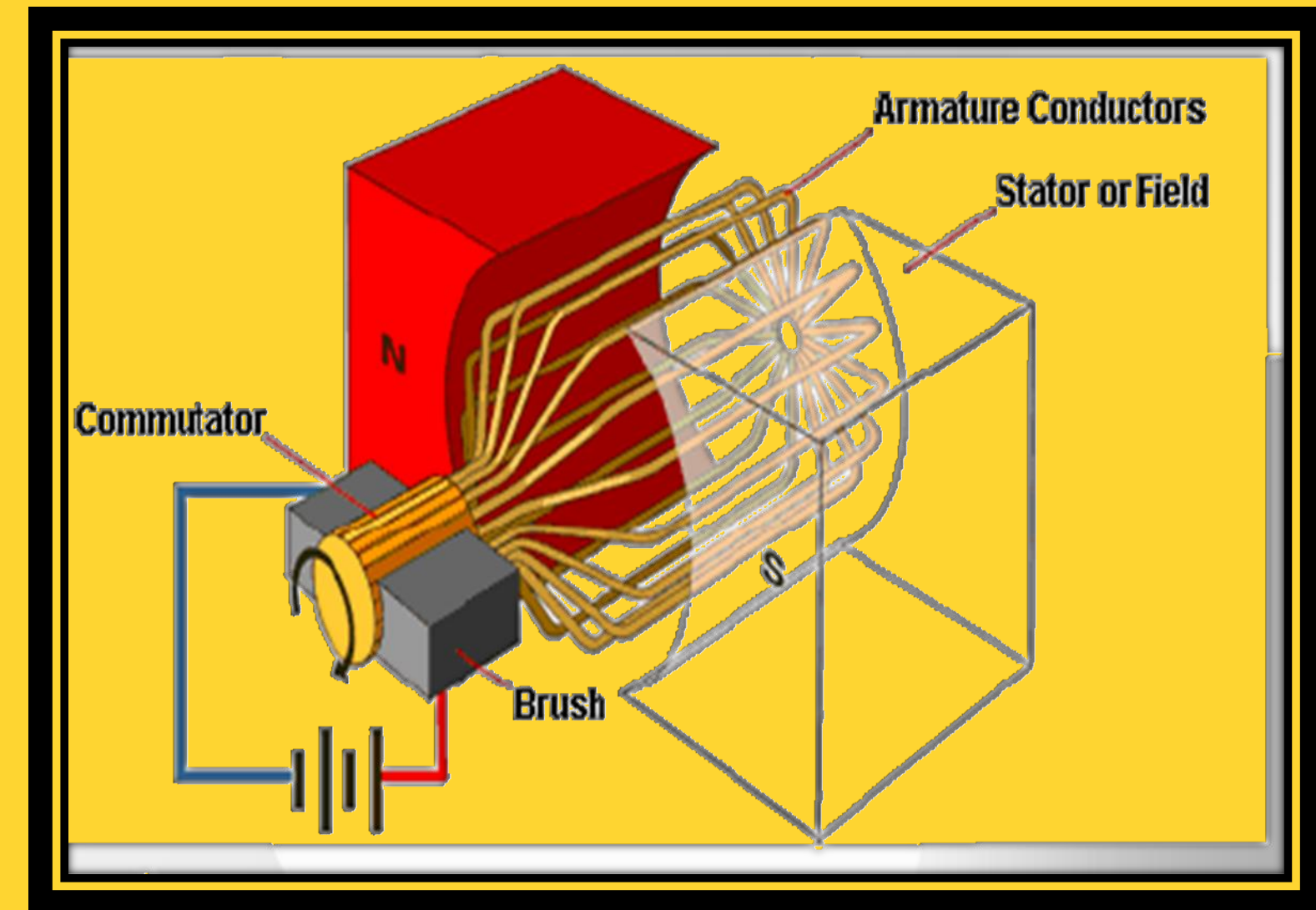E.M.F generated/conductor = $\dfrac{d\Phi}{dt}$ = $\dfrac{\Phi PN}{60}$ volts

No. of conductors (in series) in one parallel path= Z / A

$\therefore$ E.M.F generated/path= $\dfrac{\Phi PN}{60} \times \dfrac{Z}{A}$ Volts

$\therefore$ **Generate E.M.F, $E_g$ = $\dfrac{\Phi Z N}{60} \times \dfrac{P}{A}$ Volts**

For

           i) Wave winding   A = 2
           ii) Lap winding    A = P

# Recall the Terms

1. Z =------------------------------------------------

2. P= ------------------------------------------------

3. A =------------------------------------------------

4. N= ------------------------------------------------

# THANK YOU