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: 23EET203 Electrical Machines I

II YEAR / III SEMESTER

Unit 1 – DC Generator

Topic 4: EMF Equation of DC generator

What We'll Discuss

TOPIC OUTLINE

EMF Equation

Assessment

EMF Equation of a generator

Let

- Φ = 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 = $\frac{d\Phi}{dt}$ volt

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

EMF Equation of a generator

No. of revolutions/sec=N/ 60

∴Time for one revolution , dt= 60 /N sec

According to Faraday's Law of electro magnetic induction

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

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

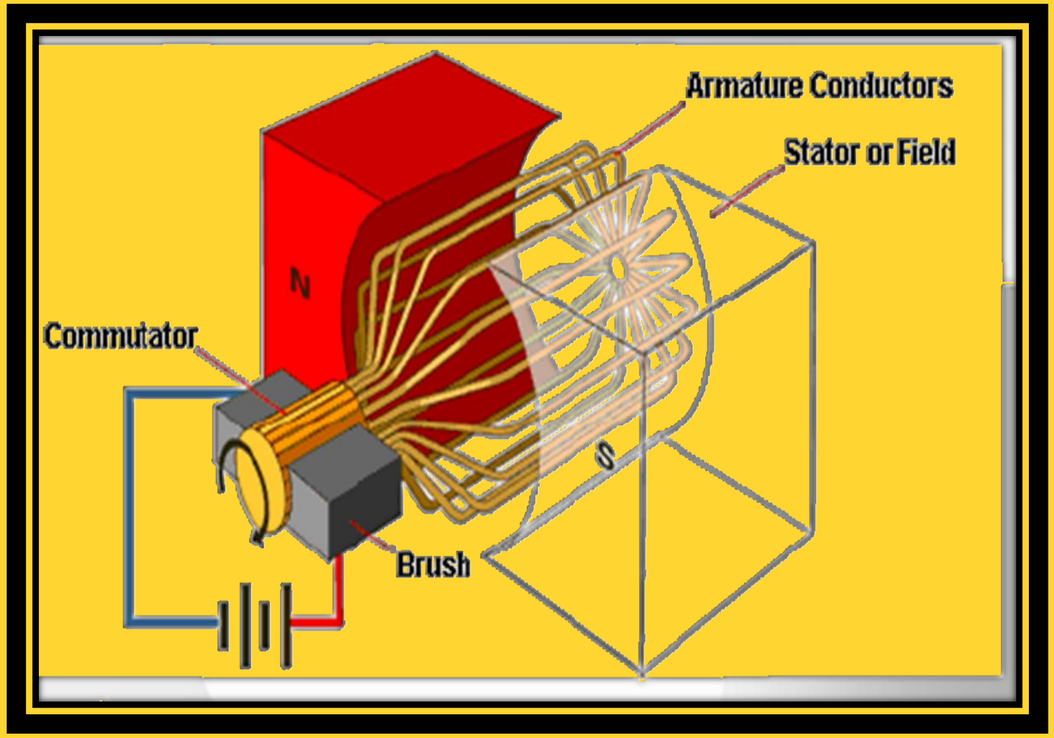
∴E.M.F generated/path= $\frac{\Phi PN}{60} \times \frac{Z}{A}$ Volts

∴Generate E.M.F, $E_g = \frac{\Phi Z N}{60} \times \frac{P}{A}$ 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