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 COMPUTER SCIENCE AND DESIGN

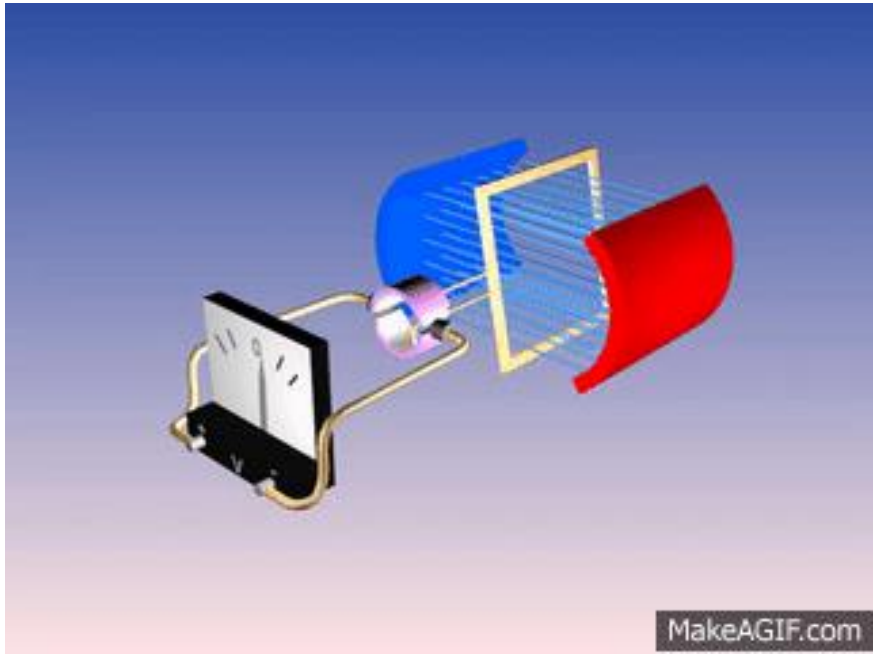
COURSE NAME : 19EE01 BASIC ELECTRICAL AND ELECTRONICS ENGINEERING

I YEAR /II SEMESTER - COMPUTER SCIENCE AND DESIGN

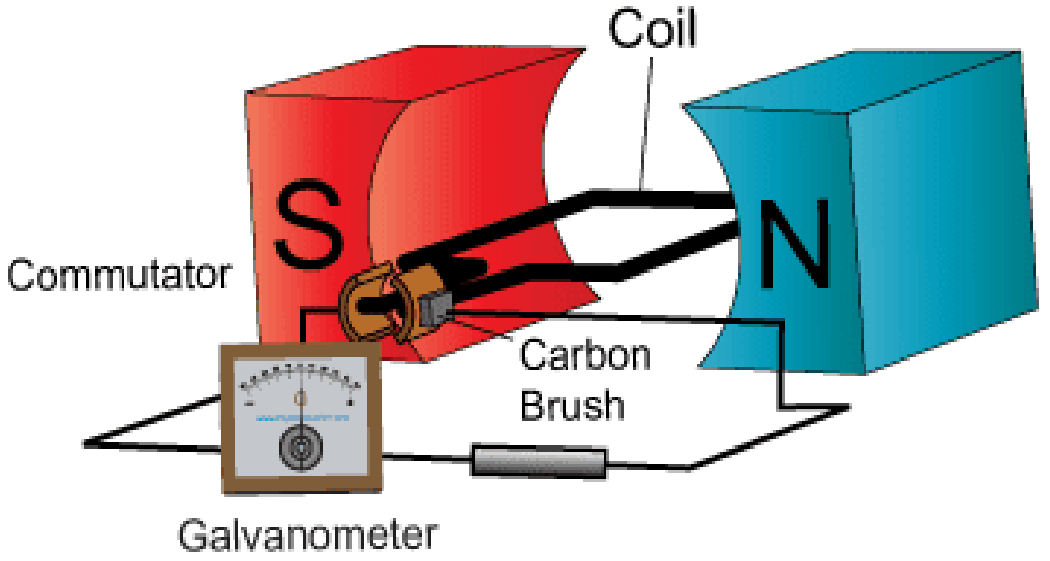
Unit 2 – ELECTRICAL MACHINES

Topic 1 : Working Principle of DC Machine

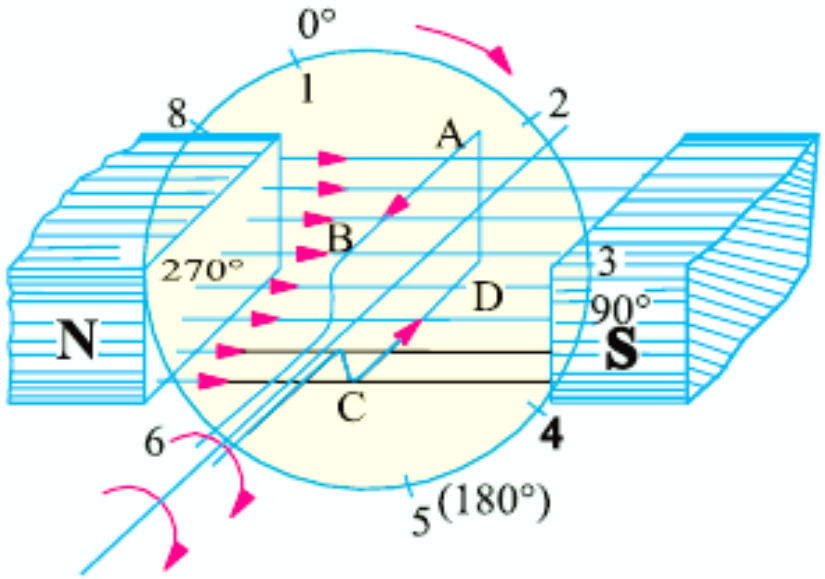
FARADAYS LAW OF ELECTROMAGNETIC INDUCTION

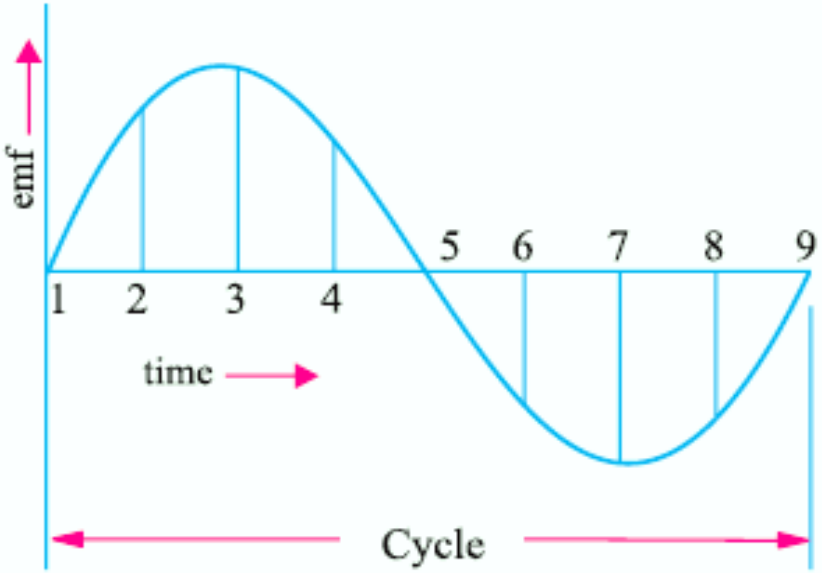


DC Generator Principle



EMF GENERATION





Rate of change of flux , $e = d\Phi/dt$

EMF EQUATION OF DC MACHINE

Let

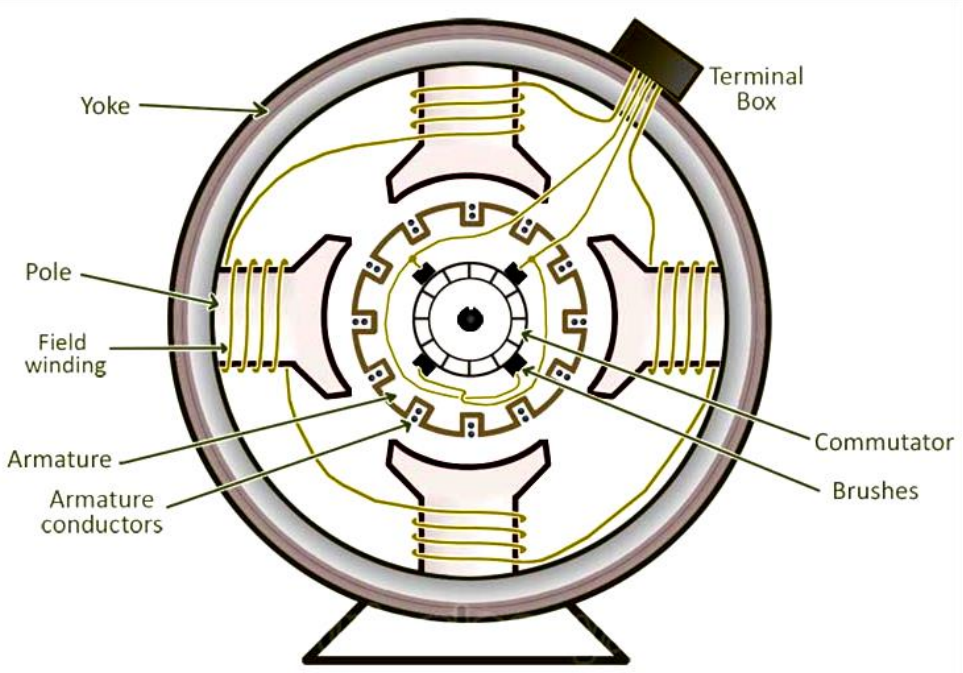
P = no of poles

Z = no of conductors distributed in the armature

Φ = flux produced by each pole in weber

N = speed of the rotor in r.p.m

A = no of parallel paths



ASSESSMENT 1

1.Define Faradays Law of Electromagnetic Induction.

2. The EMF generated will be maximum when conductor angle is _____ and _____

EMF EQUATION OF DC MACHINE

The induced emf within the armature conductors is according to the faraday law of electromagnetic induction.

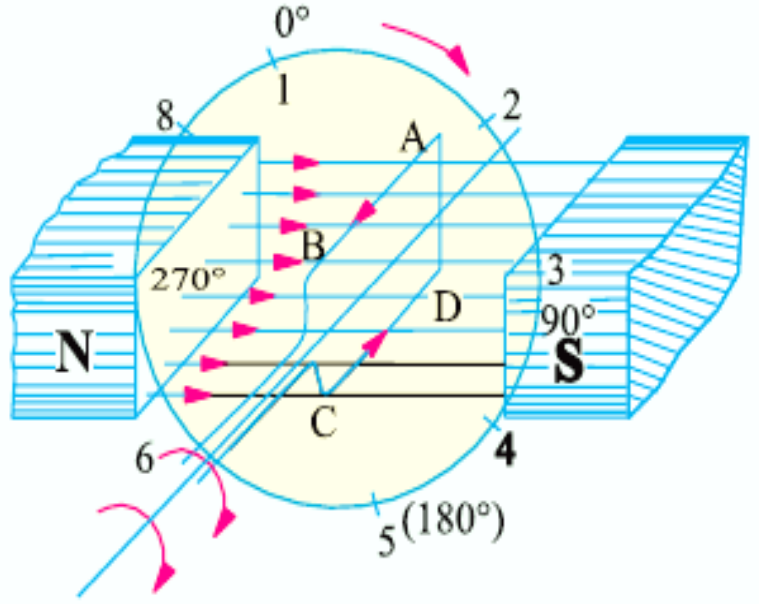
where e = rate of change of flux , $e = d\Phi/dt$

Total flux produced (Φ_T) or ($d\Phi$) = flux produced by individual pole * no of poles

$$(\Phi_T) = \Phi * P$$

The time required for a conductor

to complete one revolution (dT) = 60/N



EMF EQUATION OF DC MACHINE

substituting these values in emf induced, we get

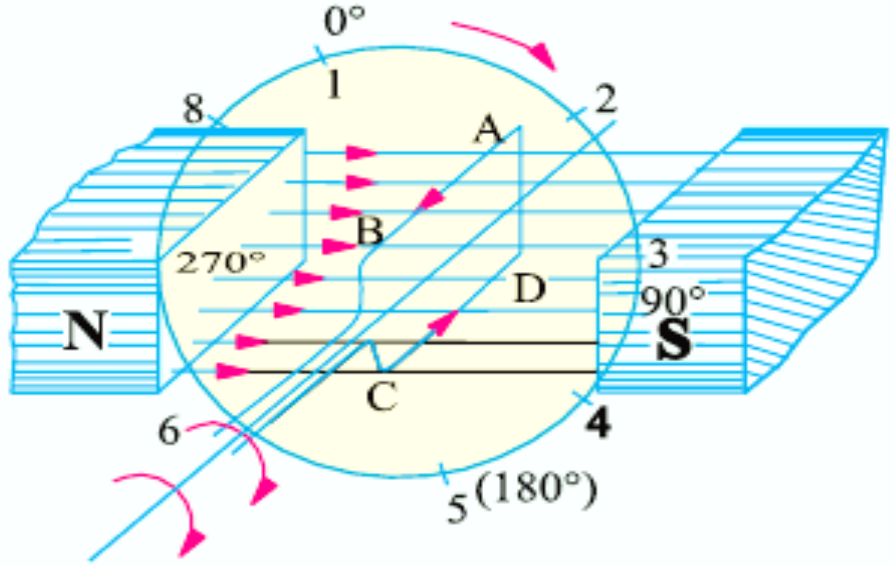
$e = \Phi * P / 60/N$

$e = \Phi * P * N / 60$ for one conductor

$e = \Phi * P * N * Z / 60 * A$ for 'Z' conductors for 'A' parallel paths

Therefore, the EMF equation

is given as $e = \Phi * P * N * Z / 60 * A$



Assessment 2

1. Write the emf equation of DC Generator
2. A 4 pole generator with wave wound armature has 51 slots each having 24 conductors. The flux per pole is 10 mWb. Speed of the generator is 750 rpm. Determine the Induced Emf

REFERENCES

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THANK YOU