

2012 MAR 2

MAGNETIC FLUX :

$$\underline{\Phi}_B = BA \cos \theta$$

3 WAYS FOR MAGNETIC FLUX TO CHANGE =

① B CHANGES

② A CHANGES

③ θ CHANGES

REMINDER OF FARADAY'S LAW:

$$\mathcal{E} = -N \frac{\Delta \Phi_B}{\Delta t}$$

- EMF DEPENDS ON THE CHANGE IN MAGNETIC FLUX
- IF Φ_B IS NOT CHANGING, THEN $\mathcal{E} = 0$.

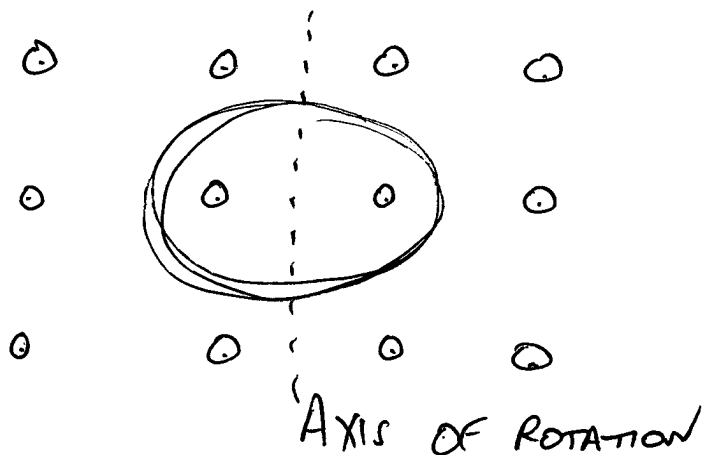
ELECTRIC GENERATORS

3

① GET SOMETHING ROTATING

- WIND
 - HYDRO
 - COAL
 - OIL
 - NATURAL GAS
 - NUCLEAR
- WIND OR WATER PUSHES PROPELLOR DIRECTLY
- CHEMICAL OR NUCLEAR REACTION CREATES HEAT TO BOIL WATER. STEAM GENERATED PUSHES A TURBINE (LIKE A PROPELLOR).

② MOUNT A COIL OF WIRE ON THE ROTATING THING AND PUT IT IN A MAGNETIC FIELD.



③ CHANGING MAGNETIC FLUX THROUGH COIL PRODUCES AN EMF (FARADAY'S LAW)

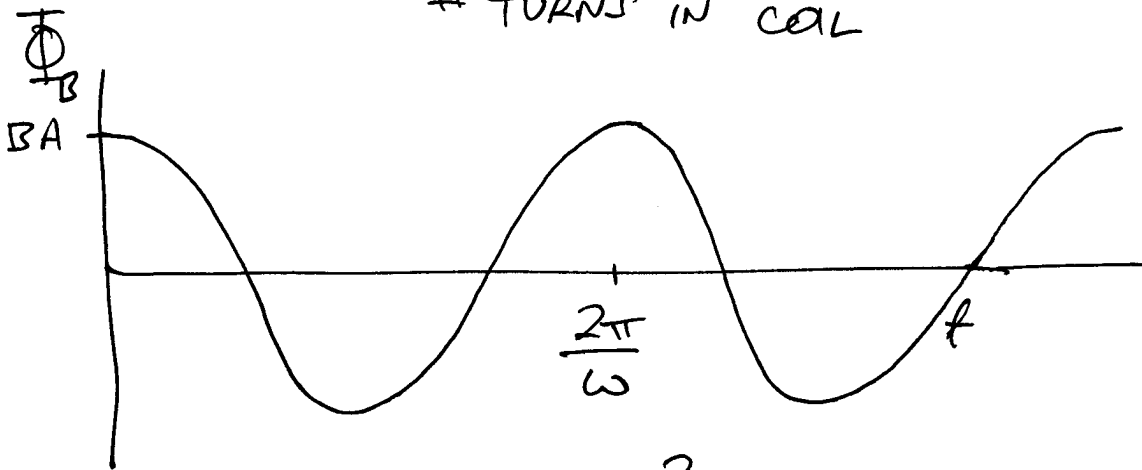
FOR ELECTRIC GENERATORS,

$$\Phi_B = BA \cos \omega t$$

ω — TIME
 — ANGULAR VELOCITY (RAD/S)

$$\mathcal{E} = \omega NBA \sin \omega t$$

N — TURNS IN COIL



$$T = \frac{2\pi}{\omega}$$

