Learning goal

Understand the principle of an alternator

Success Criteria

Deduce the factors affecting the size of the maximum induced EMF

Describe how the EMF will change during one rotation

Calculate the EMF induced in a coil

Starter:

1) State Faradays law

If a wire of length 0.3m moves at a velocity of 2ms-1 through a field of flux density 0.01T, what is the induced emf?

2) State Lenz's law

A primary solenoid is situated within a secondary solenoid. The Primary coil uses an alternating current of 50Hz to produce a flux density of 0.3T. The secondary coil has a diameter of 0.15m and 2000turns. What is the emf induced in the secondary coil? What is the polarity of the secondary compared with the primary?

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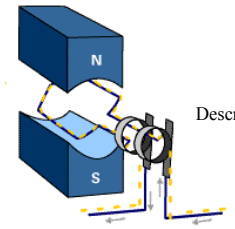

Describe the function of a simple A.C. generator

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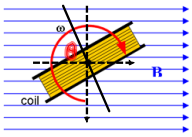

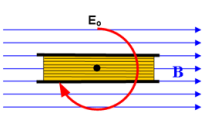

$\Phi =$ BAN cos (ω t).

$E = BANw \sin wt$

A coil has an area of 100cm^2, 800 turns and makes 600 revolutions per minute in a magnetic field of flux density 5 x 10^{-2} T. Calculate the maximum EMF.

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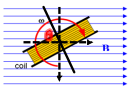
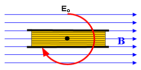
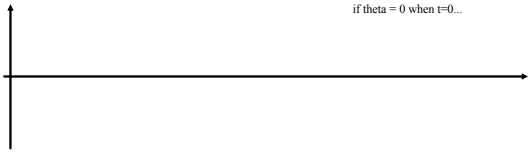




if theta = 0 when t=0...



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