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يفسر ظهور القوة المحركة الكهربائية التحريضية عن طريق التغير في التدفق المغناطيسي.

- يفسر بقانون لنز تغير جهة التيار الكهربائي المتناوب المتحرض
- يفسر مبدأ المنوب
- يقيس ذاتية وشيعة



- I

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:1

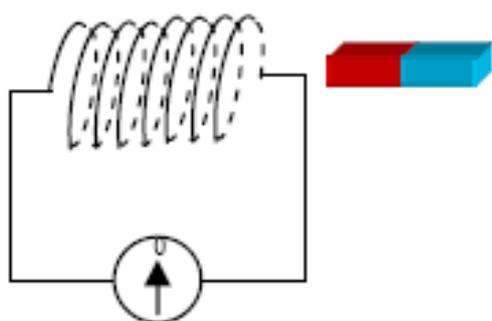
(S)

(n)

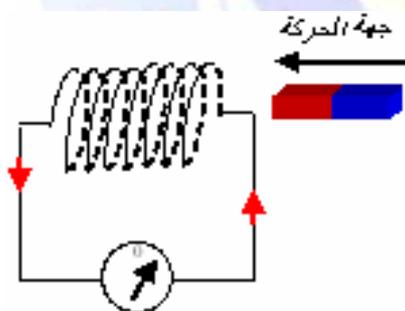
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(G)

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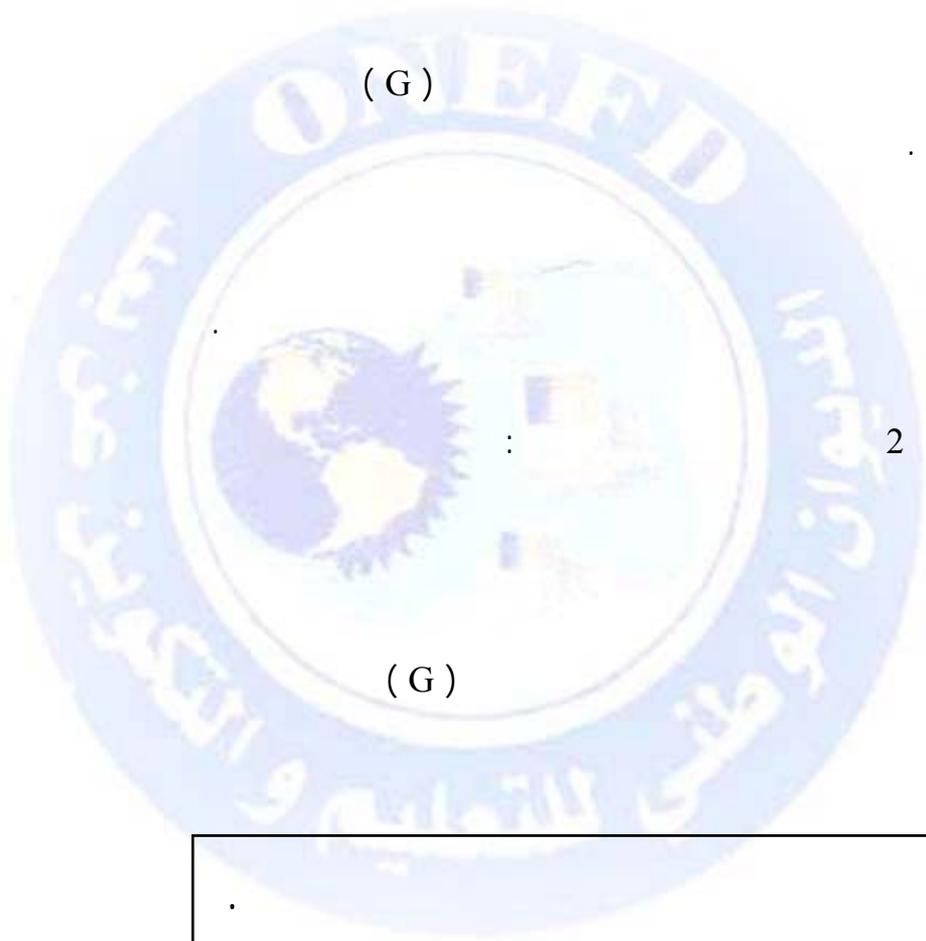
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(G)

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(G)

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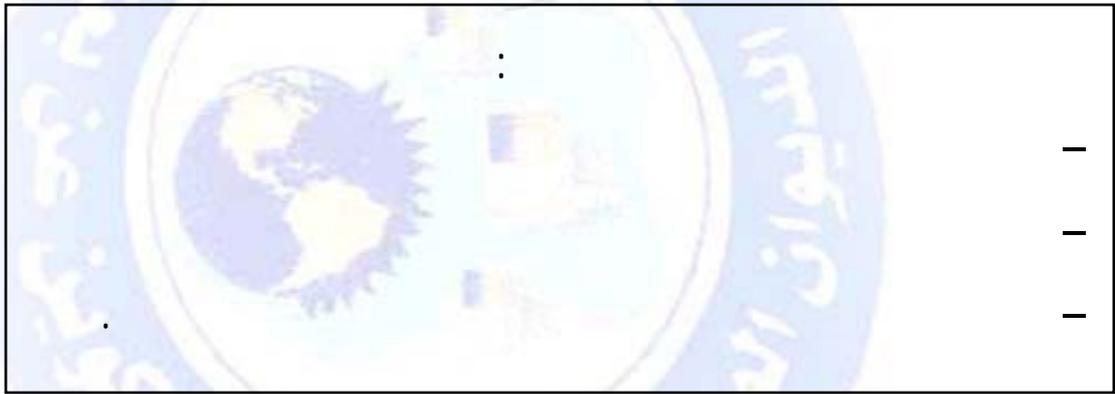
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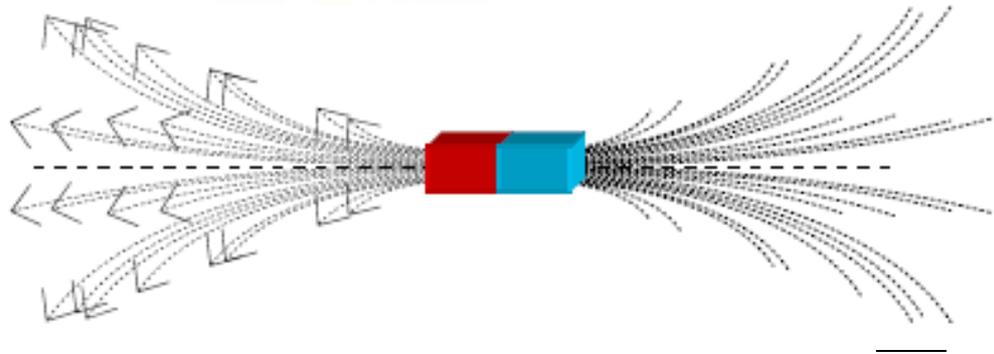
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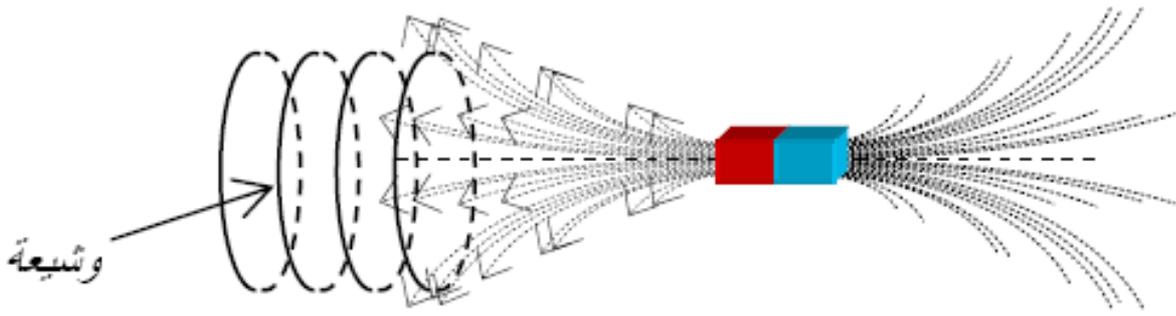
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α

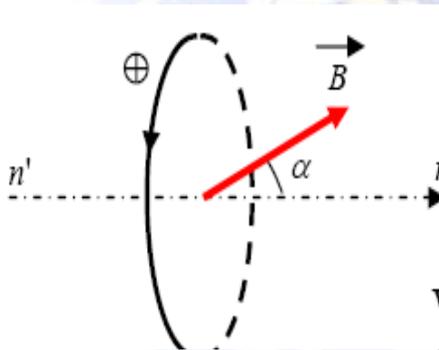


- II
 -1





- 2



$$\Phi = B \cdot S \cdot \cos(\vec{B}, \vec{n}')$$

Weber

.(W)

.Tesla

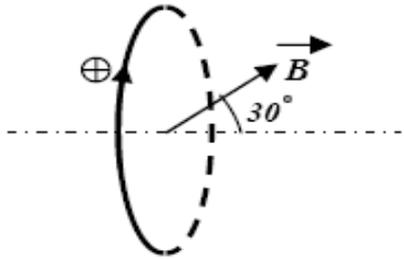
m²



⊕

(n)

$$\Phi = n \cdot B \cdot S \cdot \cos(\vec{B}, \vec{n}' \vec{n})$$



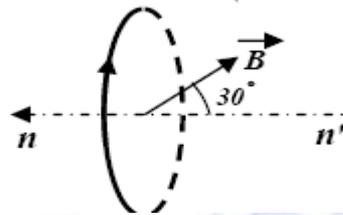
500

$$S = 75 \text{ cm}^2$$

30°

$$B = 0,02 \text{ T}$$

$$\Phi = n \cdot B \cdot S \cdot \cos(\alpha)$$



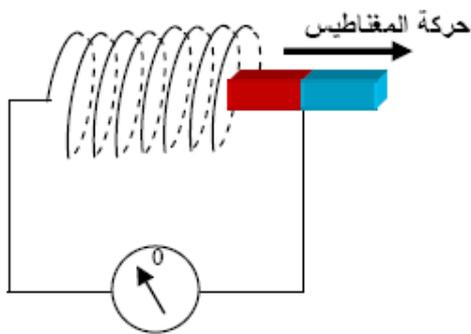
$$\alpha = 180^\circ - 30^\circ = 150^\circ$$

$$\Phi = 500 \times 0,02 \times 75 \cdot 10^{-4} \times \cos(150^\circ) \Rightarrow$$

$$\Phi = 0,065 \text{ Weber}$$

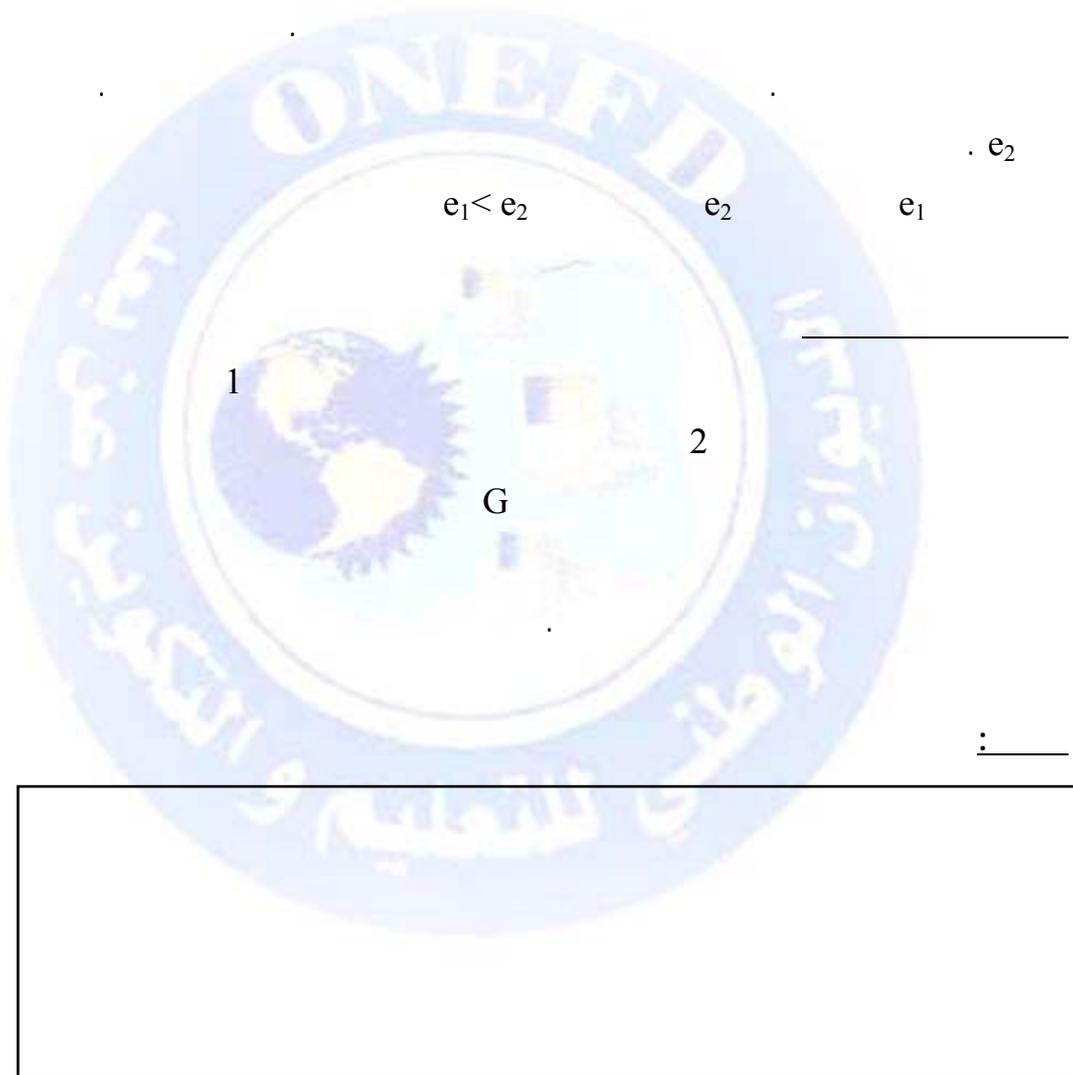
- III

- 1



e_1

2:



:

-
-

- 2

. Volt :

e

$$e = \frac{\Delta \Phi}{\Delta t} = \frac{\Phi_2 - \Phi_1}{\Delta t}$$

Φ_2
 Φ_1
 Δt

Φ_2

Φ_1

. r = 10 cm

n = 250 spire

. B = 0,025 T

(n'n)

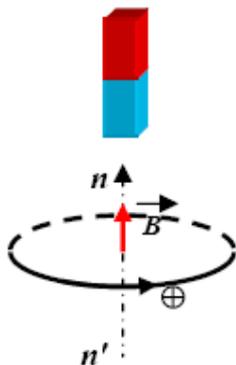
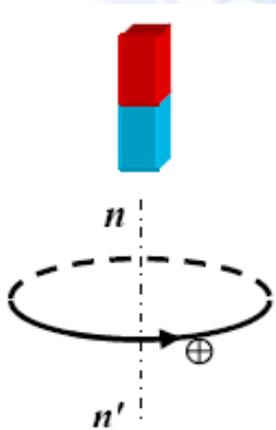
-1

-2

-3

-4

$\Delta t = 0,1 \text{ s}$



(2) (1)

-

-3

$$250 \times 0,025 \times \pi \times 0,1^2 \times \cos(0)$$

du.dz $\Phi_1 = 0,2 \text{ Weber}$ جميع الحقوق محفوظة

$$\Phi_2 = 0 \quad / -4$$

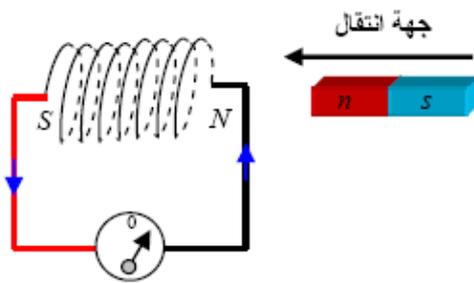
: / -4

$$e = \frac{\Delta\Phi}{\Delta t} = \frac{\Phi_2 - \Phi_1}{\Delta t} = \frac{(0 - 0,2)}{0,1}$$

$$e = -2 \text{volts}$$

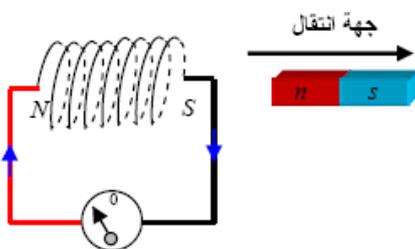
- IV

:1



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()



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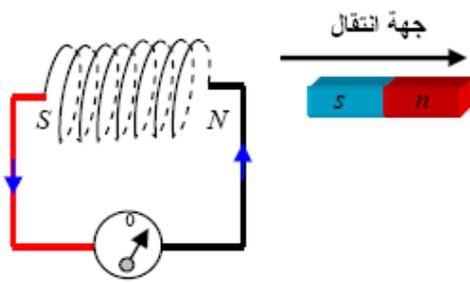
جميع الحقوق محفوظة ©

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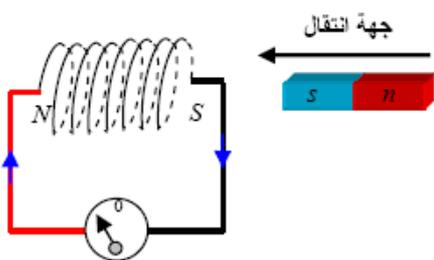
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(

_____3:



_____4:



_____:

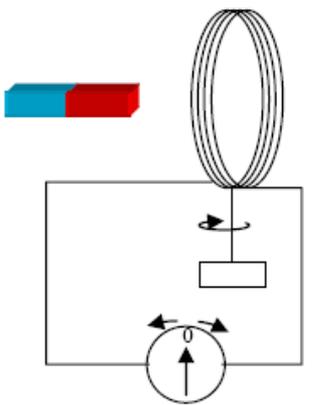
للتيار المتحرض جهة، تجعله يسعى بأفعاله لمعاكسة السبب الذي أدى إلى وجوده

_____ - V :

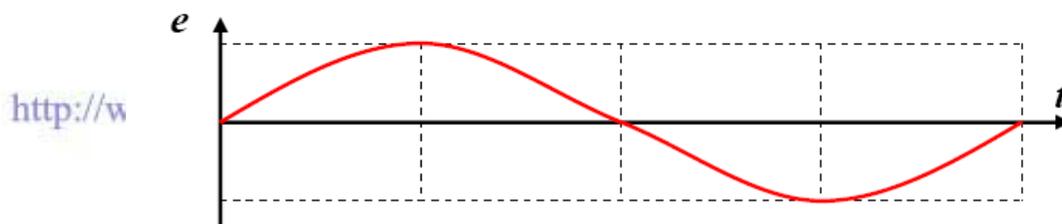
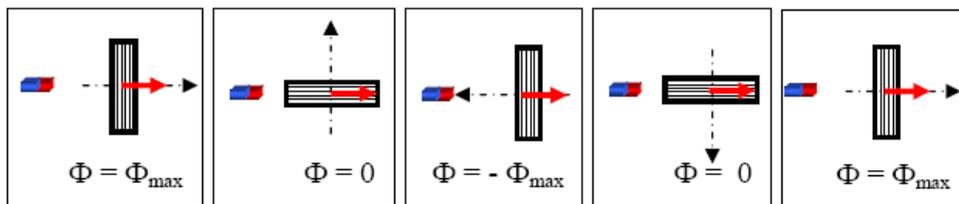
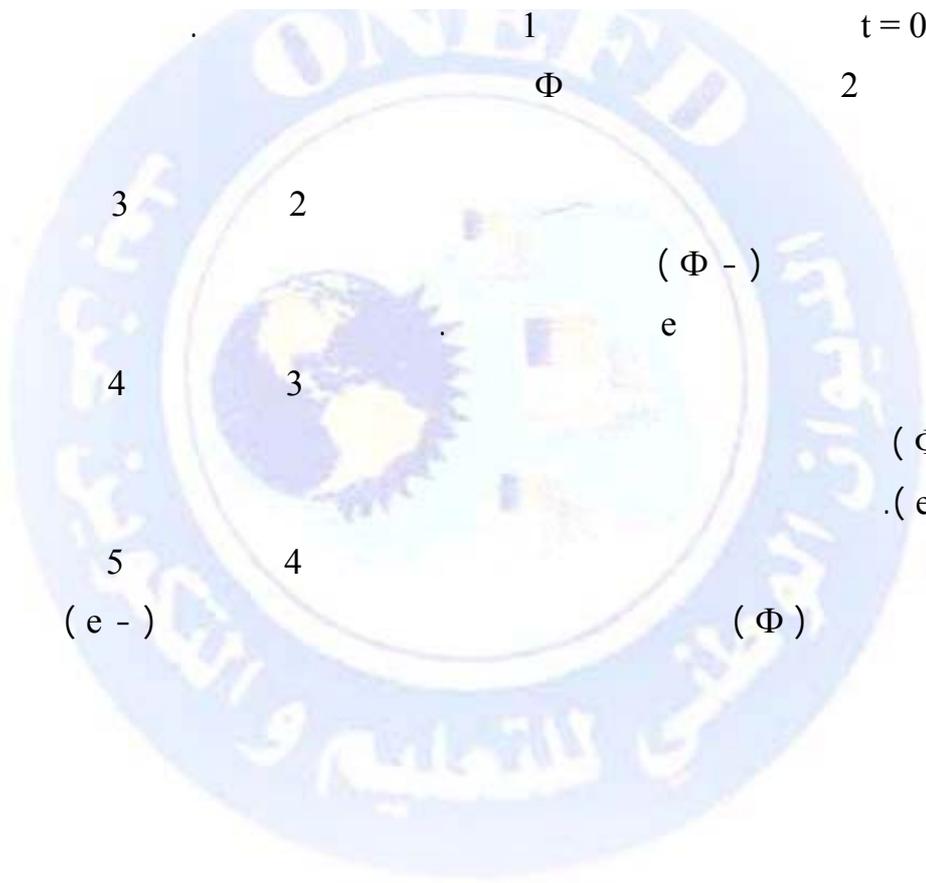
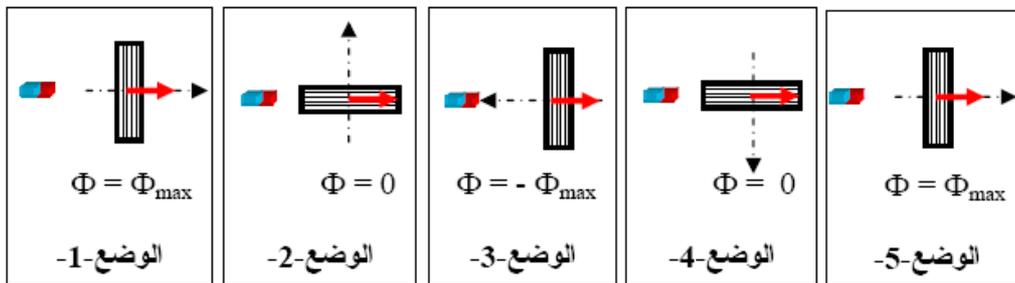
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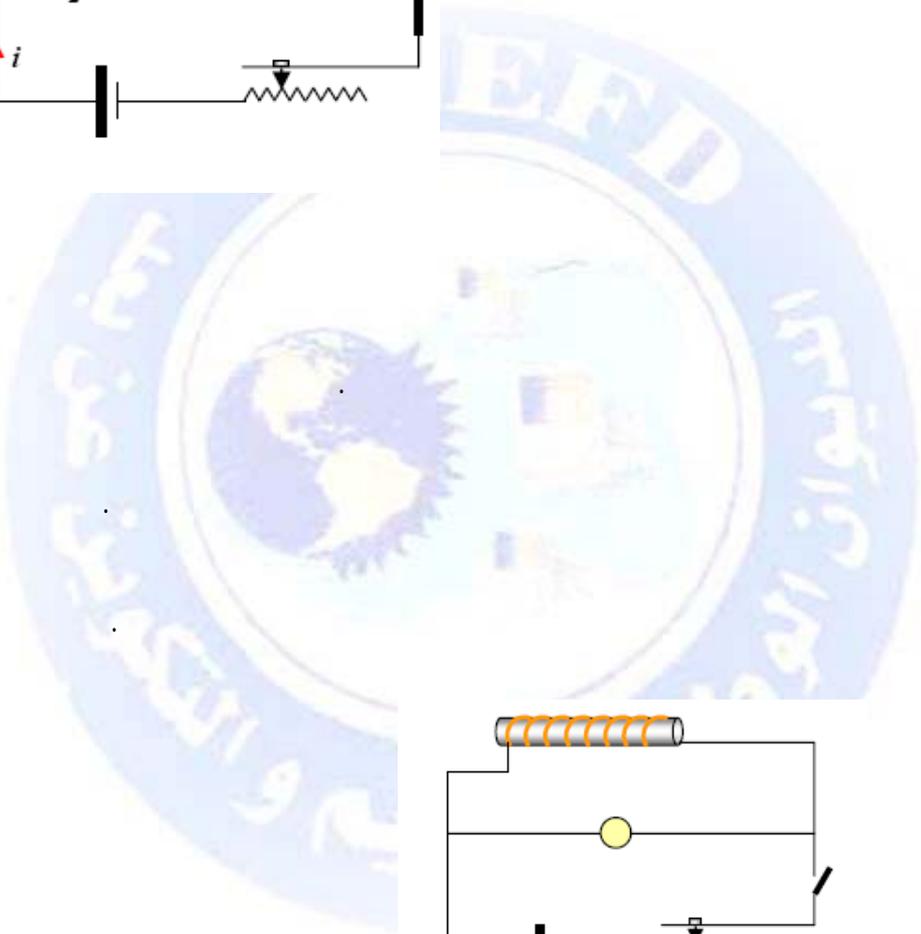
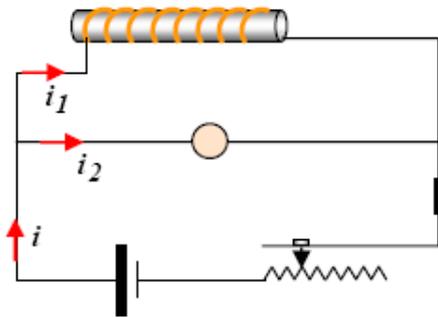
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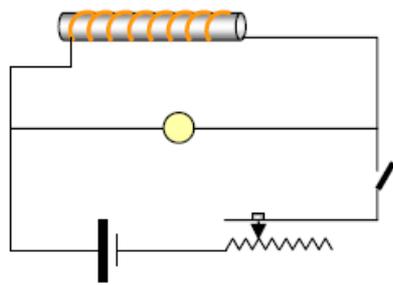
G



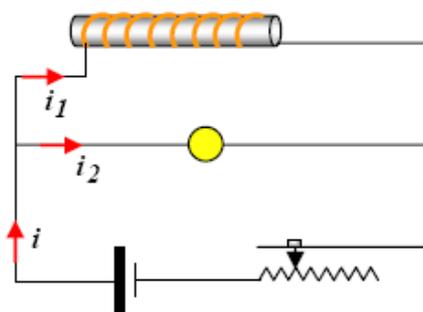
- 1 :



:1



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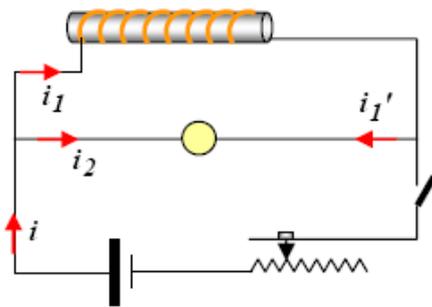
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.(Φ

1 -

i_1

(Φ)



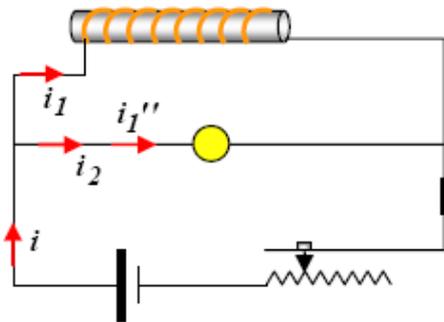
i_1

i_1

$i_1 < i_1'$

$i_1' - i_1$:

2 -



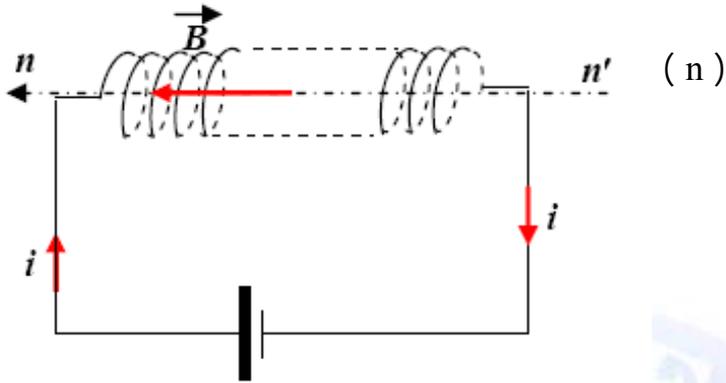
i_1

Φ

$i_1 < i_1''$

i_1

i_1



(S)

(L)

$$B = 4\pi \cdot 10^{-7} \frac{n}{l} i$$

:

$$\Phi = n \cdot B \cdot S = n \left(4\pi \cdot 10^{-7} \frac{n}{l} i \right) S$$

:

$$\Phi = 4\pi \cdot 10^{-7} n^2 \frac{S}{l} i$$

$$\left(4\pi \cdot 10^{-7} n^2 \frac{S}{l} \right)$$

. Henry

L

:

:

$$L = 4\pi \cdot 10^{-7} n^2 \frac{S}{l}$$

:

<http://www.onefd.edu.dz> $\Phi = L \cdot i$

e_1

) i_1

() i_2 (

$$E = \frac{1}{2} L (i_1^2 - i_2^2)$$

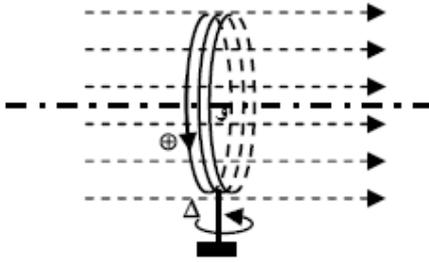
$0 > E$

$0 < E$

1

150

. $r = 5 \text{ cm}$



. $B = 0,02 \text{ T}$

Φ_1 - 1

(Δ) - 2

. $\Delta T = 0,01 \text{ s}$

. 90°

Φ_2 /

/

$R = 100 \Omega$

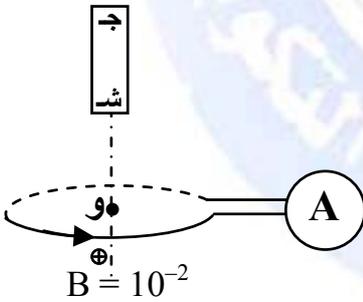
/

2

$n = 500 \text{ spires}$

. $S = 100 \text{ cm}^2$

. $R = 6 \Omega$



$B = 10^{-2}$

tesla

Φ_1 - 1

$\Delta T = 0,2 \text{ s}$

- 2

/

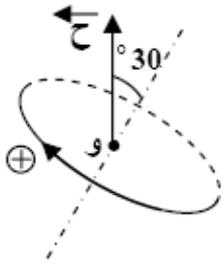
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:3

80



$r = 7 \text{ cm}$

$B = 0,01 \text{ tesla}$

$\Phi_1 \quad - 1$
 $\quad \quad - 2$

90°

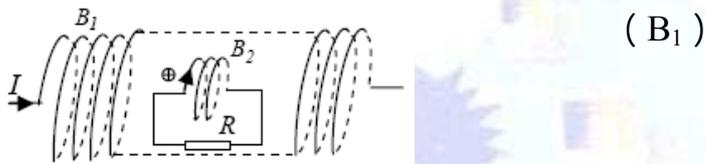
$\Delta T = \quad - 3$

$0,025 \text{ s}$

$R = 15 \Omega$

$- 4$

:4



$n = 1000 \text{ spires/m}$

(I)

$S = 30 \text{ cm}^2$

$n_2 = 20 \text{ spires}$

(B_2)

$R \quad (B_2)$

$R = 0,5 \Omega$

$= 10 \Omega$

(B_1)

$- 1$

$I = 0,25 \text{ A}$

$\Delta T = 0,002 \text{ s}$

(B_2)

Δ

$/$

$- 2$

$/$

$I = f(t)$

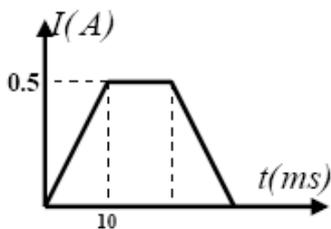
(B_1)

$/$

$I = f(t)$

(B_2)

$[0-30] \text{ s}$



$[0 - 30] \text{ s}$

$e = f(t)$

$/$

:5

. 15 cm²

. 40 cm

6000

- 1

- 2

1 A 0 /

. 3A 1 /

. 0 A 3 /



1

: Φ_1 - 1

$$\Phi_1 = n.S.B.\cos\alpha \Rightarrow \Phi_1 = 150 \times \pi \cdot 0,05^2 \times 0,02 \times \cos 0$$

$$\Phi_1 = 1,18 \text{ Weber}$$

: Φ_2 / - 2

$$\Phi_2 = n.S.B.\cos\frac{\pi}{2} \Rightarrow \Phi_2 = 0 \text{ Weber}$$

:

$$e = \frac{\Delta\Phi}{\Delta t} = \frac{\Phi_2 - \Phi_1}{\Delta t} \Rightarrow e = \frac{0 - 1,18}{0,01} \Rightarrow$$

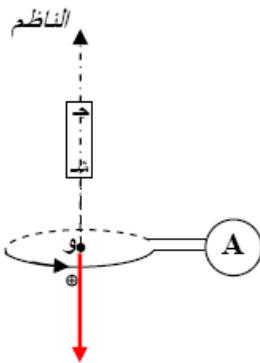
$$e = 118 \text{ volt}$$

:

$$e = R.I \Rightarrow I = \frac{e}{R} \Rightarrow I = \frac{118}{100} \Rightarrow I = 1,18 \text{ A}$$

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(π)

$$\Phi_1 = n.S.B.\cos\pi \Rightarrow \Phi_1 = 50 \times 100 \cdot 10^{-4} \times 10^{-2} \times (-1)$$

$$\Phi_1 = -0,05 \text{ Weber}$$

" "

/ -2

/

-

:

$$\Phi_2 = 0 \text{ Weber}$$

$$e = \frac{\Delta\Phi}{\Delta t} = \frac{\Phi_2 - \Phi_1}{\Delta t} \Rightarrow e = \frac{0 - (-0,05)}{0,2} \Rightarrow$$

$$e = 0,25 \text{ Volt}$$

:

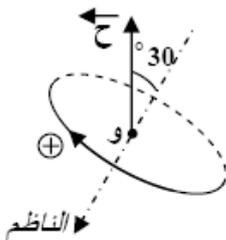
-

$$e = R.I \Rightarrow I = \frac{e}{R} \Rightarrow I = \frac{0,25}{6} \Rightarrow$$

$$I = 4,2 \cdot 10^{-2} \text{ A}$$

:3

Φ_1 - 1



$$\alpha = 180^\circ - 30^\circ = 150^\circ$$

$$\Phi_1 = n.S.B.\cos\alpha \Rightarrow \Phi_1 = 80 \times 0,01 \times \pi \times (0,07)^2 \cos 150^\circ$$

$$\Phi_1 = -3,37.10^{-3} \text{ Weber}$$

$$\Phi_2 \quad - 2$$

$$\Phi_1 = n.S.B.\cos\alpha \Rightarrow$$

$$\Phi_1 = 80 \times 0,01 \times \pi \times (0,07)^2 \cos 90$$

$$\Phi_2 = 0 \text{ Weber}$$

- 3

$$e = \frac{\Delta\Phi}{\Delta t} = \frac{\Phi_2 - \Phi_1}{\Delta t} \Rightarrow e = \frac{0 - (-3,37.10^{-3})}{0,025} \Rightarrow$$

$$e = 0,13 \text{ Volt}$$

- 4

$$e = R.I \Rightarrow I = \frac{e}{R} \Rightarrow I = \frac{0,13}{15} \Rightarrow I = 9 \text{ mA}$$

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- 1

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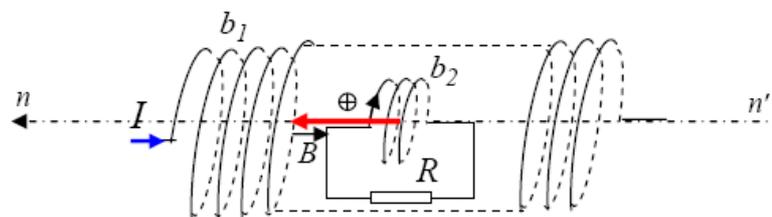
(b₁)

(b₂)

(\vec{B})

(b₂)

(n'n)



(n'n)

: (b₂)

$$\Phi_1 = n_{b_2} \cdot S_{b_2} \cdot B_{b_1} \cdot \cos \alpha \Rightarrow$$

$$\Phi_1 = n_{b_2} \cdot S_{b_2} \cdot 4 \cdot \pi \cdot 10^{-7} \cdot n_{b_1} \cdot I \cdot \cos \alpha$$

$$\Phi_1 = 20 \times 30 \cdot 10^{-4} \times 4 \cdot \pi \cdot 10^{-7} \times 1000 \times 0,25 \cos 0 \Rightarrow$$

$$\Phi_1 = 188 \cdot 10^{-7} \text{ Weber}$$

$$\Phi_2 = n_{b_2} \cdot S_{b_2} \cdot B_{b_1} \cdot \cos 90^\circ \Rightarrow \Phi_2 = 0 \text{ Weber}$$

:

$$\Delta \Phi = \Phi_2 - \Phi_1 = 0 - 188 \cdot 10^{-7} \Rightarrow \Delta \Phi = -188 \cdot 10^{-7} \text{ Weber}$$

/

$$e = R \cdot I \Rightarrow I = \frac{e}{R} \Rightarrow I = \frac{\frac{\Delta \Phi}{R}}{R} \Rightarrow I = \frac{\Delta \Phi}{R \cdot \Delta t}$$

$$I = \frac{-188 \cdot 10^{-7}}{(10 + 0,5) \times 0,002} \Rightarrow I = -9 \cdot 10^{-4} \text{ A}$$

- 2

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(b₁)

(b₂)

)

(b₁)

α

(b₂)

$$\Delta\Phi = 4.\pi.10^{-7}.n_{b_2}.S_{b_2}.n_{b_1}.\Delta I. \Rightarrow$$

$$\Delta\Phi = 4.\pi.10^{-7}.20 \times 30.10^{-4} \times 1000.\Delta I.$$

$$\Delta\Phi = 7,5.10^{-5}.\Delta I.$$

0,5 A 0 (I) : _____

$$\Delta\Phi = 7,5.10^{-5}.(0,5 - 0) \Rightarrow \Delta\Phi = 3,75.10^{-5} \text{ Weber}$$

:

$$I = \frac{\Delta\Phi}{R.\Delta t} \Rightarrow I = \frac{3,75.10^{-5}}{10,5 \times 0,01} \Rightarrow I = 35,7.10^{-5} \text{ A}$$

(I) : _____

$$\Delta\Phi = 7,5.10^{-5}.\Delta I. \Rightarrow \Delta\Phi = 7,5.10^{-5}.(0) \Rightarrow$$

$$\Delta\Phi = 0 \text{ Weber}$$

$$I = 0 \text{ A} :$$

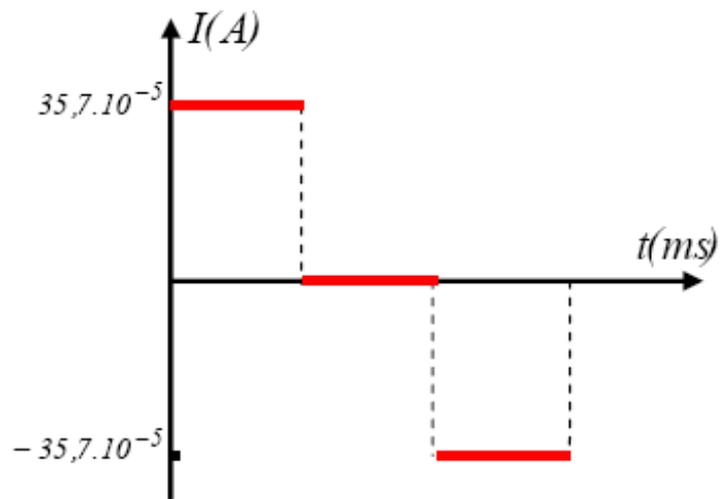
0,5 A (I) : _____

$$\Delta\Phi = 7,5.10^{-5}.\Delta I. \Rightarrow \Delta\Phi = 7,5.10^{-5}.(0 - 0,5) \Rightarrow$$

$$\Delta\Phi = -3,75.10^{-5} \text{ Weber}$$

:

$$I = \frac{\Delta\Phi}{R.\Delta t} \Rightarrow I = \frac{-3,75.10^{-5}}{10,5 \times 0,01} \Rightarrow I = -35,7.10^{-5} \text{ A}$$



: - 1

$$L = 4 \pi \cdot 10^{-7} n^2 \frac{S}{l} \Rightarrow L = 4 \pi \cdot 10^{-7} n^2 \frac{S}{l}$$

$$L = 4\pi \cdot 10^{-7} \times 6000^2 \times \frac{15 \cdot 10^{-4}}{0.4} \Rightarrow L = 0,16 \text{ Henry}$$

- 2

$$E = \frac{1}{2} L (i_1^2 - i_2^2)$$

$$(1 \text{ A}) \quad (0) \quad /$$

$$E = \frac{1}{2} L (i_1^2 - i_2^2) \Rightarrow E = \frac{1}{2} 0,16 (0^2 - 1^2)$$

$$E = -0,08 \text{ joule}$$

$$: 3 \text{ A} \quad 1 \text{ A} \quad /$$

$$E = \frac{1}{2} 0,16 (1^2 - 3^2) \Rightarrow E = -0,64 \text{ joule}$$

$$: 0 \text{ A} \quad 3 \text{ A} \quad /$$

$$E = \frac{1}{2} 0,16 (3^2 - 0^2) \Rightarrow E = 0,72 \text{ joule}$$