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|  | CIFP NAUTICOPESQUERA | Curs: 2024-25 |
| | Avaluació Mòdul: OME | Grup: MAP33A |
| | | Data: 28/11/24 |

Nom del alumne/a:

Qualificació:

Criteris de qualificació:

Temps: 90 min

Observacions: Cada nombre sense unitat resta 1 punt

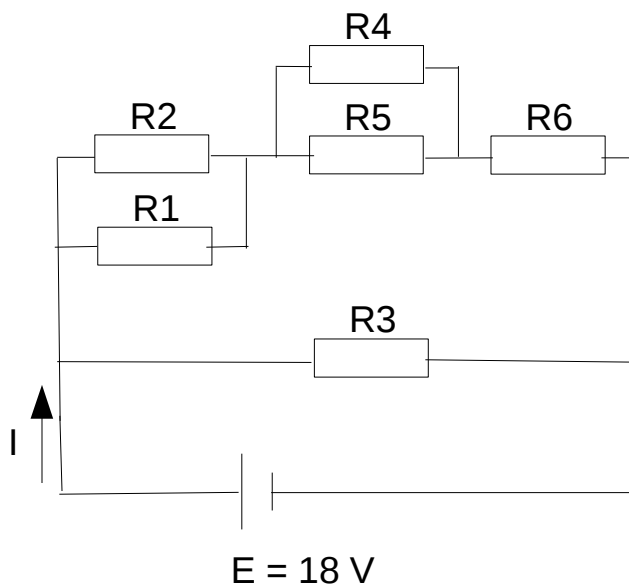
Els exercicis 1 i 2 són per recuperar el examen del 06/11/24

Exercici 1:


3p

$$R_1 = 1\Omega \quad \dots \quad R_6 = 6\Omega$$

Calcula tensions, corrents i potències en les resistències.



| | R_1 | R_2 | R_3 | R_4 | R_5 | R_6 | Total |
|---|-----------|-----------|-----------|-----------|-----------|-----------|--------------|
| E | 1,36 V | 1,36 V | 18V | 4,5 V | 4,5 V | 12,2 V | 18 V |
| I | 1,36 A | 0,68 A | 6 A | 1,13 A | 0,9 A | 2,03 A | 8,03 A |
| R | 1Ω | 2Ω | 3Ω | 4Ω | 5Ω | 6Ω | $2,24\Omega$ |
| P | 1,36 W | 0,92 W | 108 W | 5,1 W | 4,05 W | 24,7 W | 144,5 W |

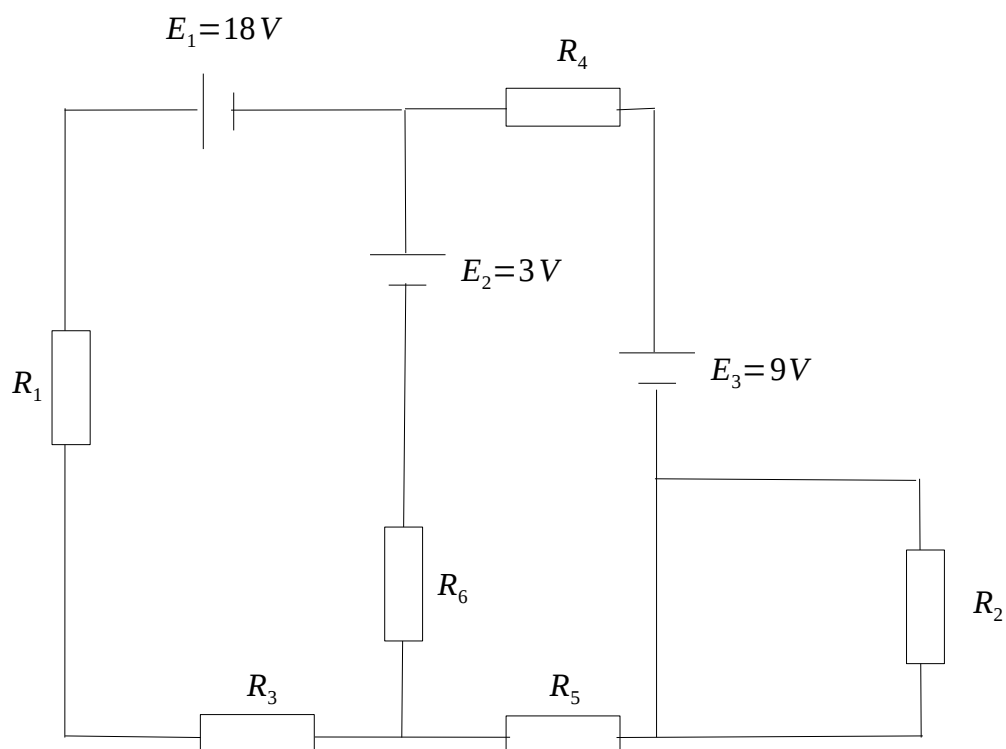
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Exercici 2:

3 p

Indica la matriu per a calcular els corrents I_a , I_b , I_c , I_d , I_e .

$R_1=1\ \Omega$... $R_6=6\ \Omega$




The circuit diagram shows two meshes, I and II. Mesh I contains a 18V DC source, a 4Ω resistor (R1), a 6Ω resistor (R3), and a 3V DC source. Mesh II contains a 9V DC source, a 9Ω resistor (R2), a 6Ω resistor (R5), and a 3V DC source. A dependent current source $I_d = I_e$ is connected between nodes B and C. The current I_a flows through R1, I_b through R3, and I_c through R2. The current I_e flows through R2, and I_d flows through the dependent current source. The current I_c is also labeled as I_d .

$I_e = 0, I_c = I_d$
 Incògnites: I_a, I_b, I_c
 Nudo A: $-I_a - I_b - I_c = 0A$
 Malla 1: $18V + 3V + 6\Omega \cdot I_b - I_a \cdot 4\Omega = 0V$
 Malla 2: $9V + 9\Omega \cdot I_c - 3V - 6\Omega \cdot I_b = 0V$

| I_a | I_b | I_c | |
|-------|-------|-------|-----|
| -1 | -1 | -1 | 0 |
| -4 | 6 | 0 | -21 |
| 0 | -6 | 9 | -6 |

$I_a = \frac{117}{38}A = 3,1A$
 $I_b = -\frac{55}{38}A = -1,45A$
 $I_c = -\frac{31}{19}A = -1,63A$
 $I_d = -1,63A$
 $I_e = 0A$

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Exercici 3:

3 p

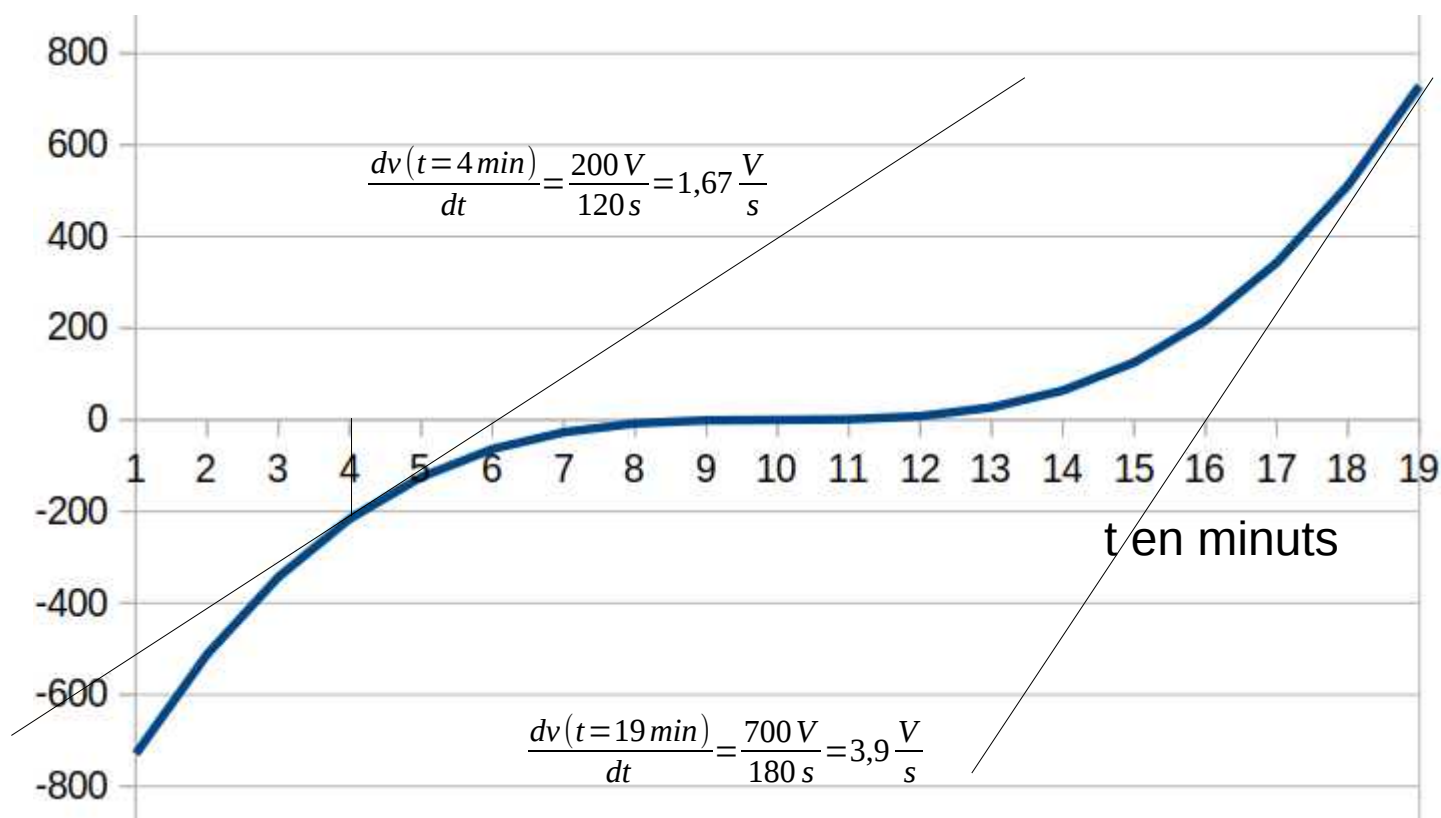
El gràfic mostra la tensió d'un condensador en funció del temps.

Indica la pendent en $t_1 = 4 \text{ min}$ i $t_2 = 19 \text{ min}$ i calcula el corrent

corresponent.

$C = 300 \text{ mF}$


E en V



$$i(t) = \frac{C \cdot dv}{dt}$$

$$\rightarrow i(t=4 \text{ min}) = C \cdot \frac{dv(t=4 \text{ min})}{dt} = 0,3 \text{ F} \cdot 1,67 \frac{\text{V}}{\text{s}} = 0,5 \text{ A}$$

$$\rightarrow i(t=19 \text{ min}) = C \cdot \frac{dv(t=19 \text{ min})}{dt} = 0,3 \text{ F} \cdot 3,9 \frac{\text{V}}{\text{s}} = 1,17 \text{ A}$$

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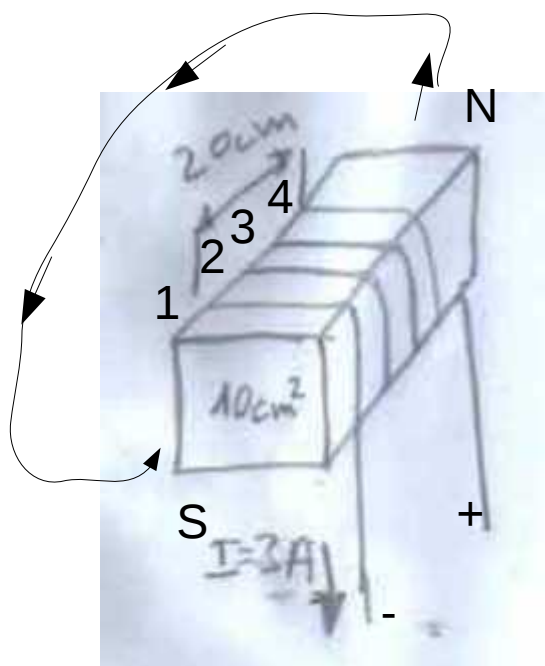
Exercici 4:

3 p

Per la bobina de la imatge calcula: mmf, Φ , H, B i R_{mag} .

$$\mu_r = 600$$

Senyala la direcció del camp magnètic.



$$mmf = 4 \cdot 3 \text{ A} = 12 \text{ Av}$$

$$H = \frac{mmf}{l} = \frac{12 \text{ Av}}{0,2 \text{ m}} = 60 \frac{\text{Av}}{\text{m}}$$

$$\mu = \mu_r \cdot \mu_0 = 600 \cdot 4 \cdot \pi \cdot 10^{-7} \frac{\text{T} \cdot \text{m}}{\text{Av}} = 7,5 \cdot 10^{-4} \frac{\text{T} \cdot \text{m}}{\text{Av}}$$

$$B = \mu \cdot H = 7,5 \cdot 10^{-4} \frac{\text{T} \cdot \text{m}}{\text{Av}} \cdot 60 \frac{\text{Av}}{\text{m}} = 4,52 \cdot 10^{-2} \text{ T}$$

$$\Phi = B \cdot S = 4,52 \cdot 10^{-2} \cdot 0,001 \text{ m}^2 = 4,52 \cdot 10^{-5} \text{ Wb}$$

$$R_{mag} = \frac{mmf}{\Phi} = \frac{12 \text{ Av}}{4,52 \cdot 10^{-5} \text{ Wb}} = 2,65 \cdot 10^5 \frac{\text{Av}}{\text{Wb}}$$