Kap. 26
Likestrømskretser

Målsetning:

Kunne analysere enkle likestrømskretser

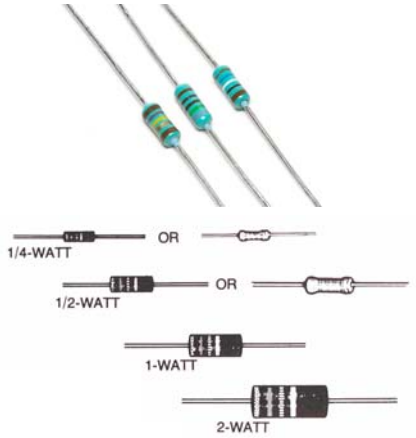
Punktvis:

- Resistanser i serie og parallell
- Kirchoffs regler
- RC-kretser

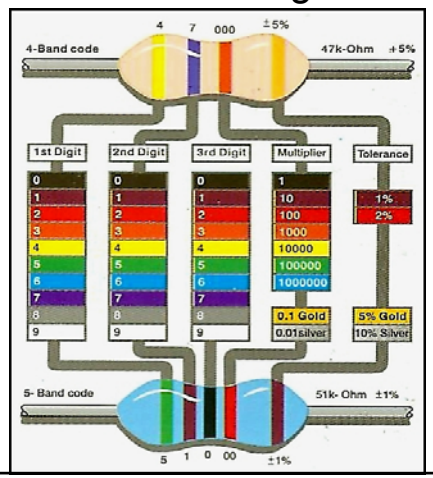
Pensum:

- Y & F kap 26.1 + 2 + 4

Motstander

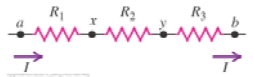


Motstander. Fargekoder.



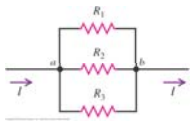
Motstander

Serie: $R = R_1 + R_2 + R_3$



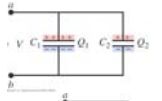
Parallell: $1/R = 1/R_1 + 1/R_2 + 1/R_3$

$G = G_1 + G_2 + G_3$

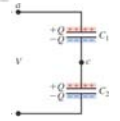


Motsatt for kondensatorer:

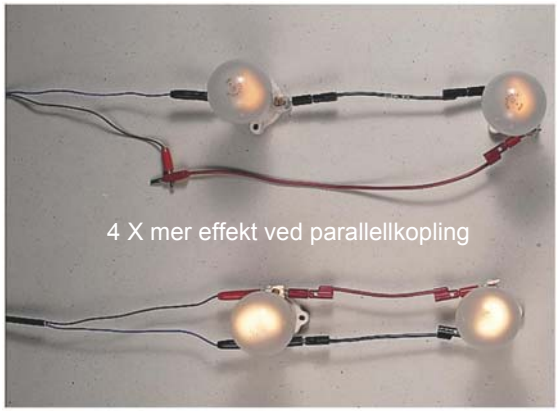
Parallell: $C = C_1 + C_2 + C_3$



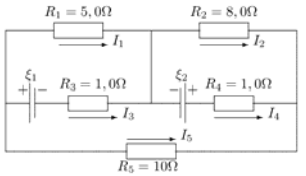
Serie: $1/C = 1/C_1 + 1/C_2 + 1/C_3$



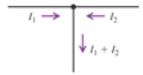
Eks. 1 Effekt i parallell- og seriekopling



Kirchoffs regler

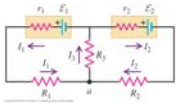


1. Strømlov (knutepunktregel): $\Sigma I_k = 0$

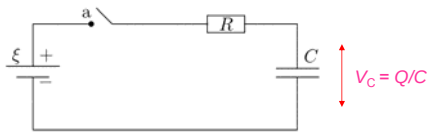


2. Spenningslov (maskestrømsregel): $\Sigma V_k = 0$

OBS fortegn, tenk på spenningsdiagram



RC-kretser



Kondensatorspennng V_C inngår i Kirchoffs maskestrømsregel.

OBS: Q tar tid å endres:
Ladning på kondensator Q kan **ikke** endres brått.
=> Spenning på kondensator $V_C = Q_C/C$ kan **ikke** endres brått.

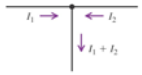
Strøm til kondensator $I = dQ/dt$ kan endres brått.

Spenning over motstand $V_R = RI$ kan endres brått.
Strøm $I = V_R / R$ gjennom motstand kan endres brått.

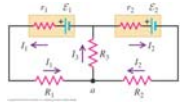
Kap. 26: Likestrømskretser Oppsummering

Motstander i serie: $R = R_1 + R_2 + R_3$
Motstander i parallell:
Resistans R: $1/R = 1/R_1 + 1/R_2 + 1/R_3$
Konduktans G: $G = G_1 + G_2 + G_3$

Kirchoffs regler:
1. Strømlov (knutepunktlov): $\Sigma I_k = 0$



2. Spenningslov (maskestrømslov): $\Sigma V_k = 0$
OBS fortegn, tenk på spenningsdiagram



RC-kretser:
Kondensatorspennng V_C inngår i Kirchoffs maskestrømsregel.
V_C og $Q = CV_C$ tar tid å endres:
Spenning på kondensator $V_C = Q_C/C$ kan **ikke** endres brått.
Strøm til kondensator $I = dQ/dt$ kan endres brått.

Spenning over motstand $V_R = RI$ kan endres brått.