Midterm Review

EMT1150
Introduction to Circuit Analysis

Department of Computer Engineering Technology

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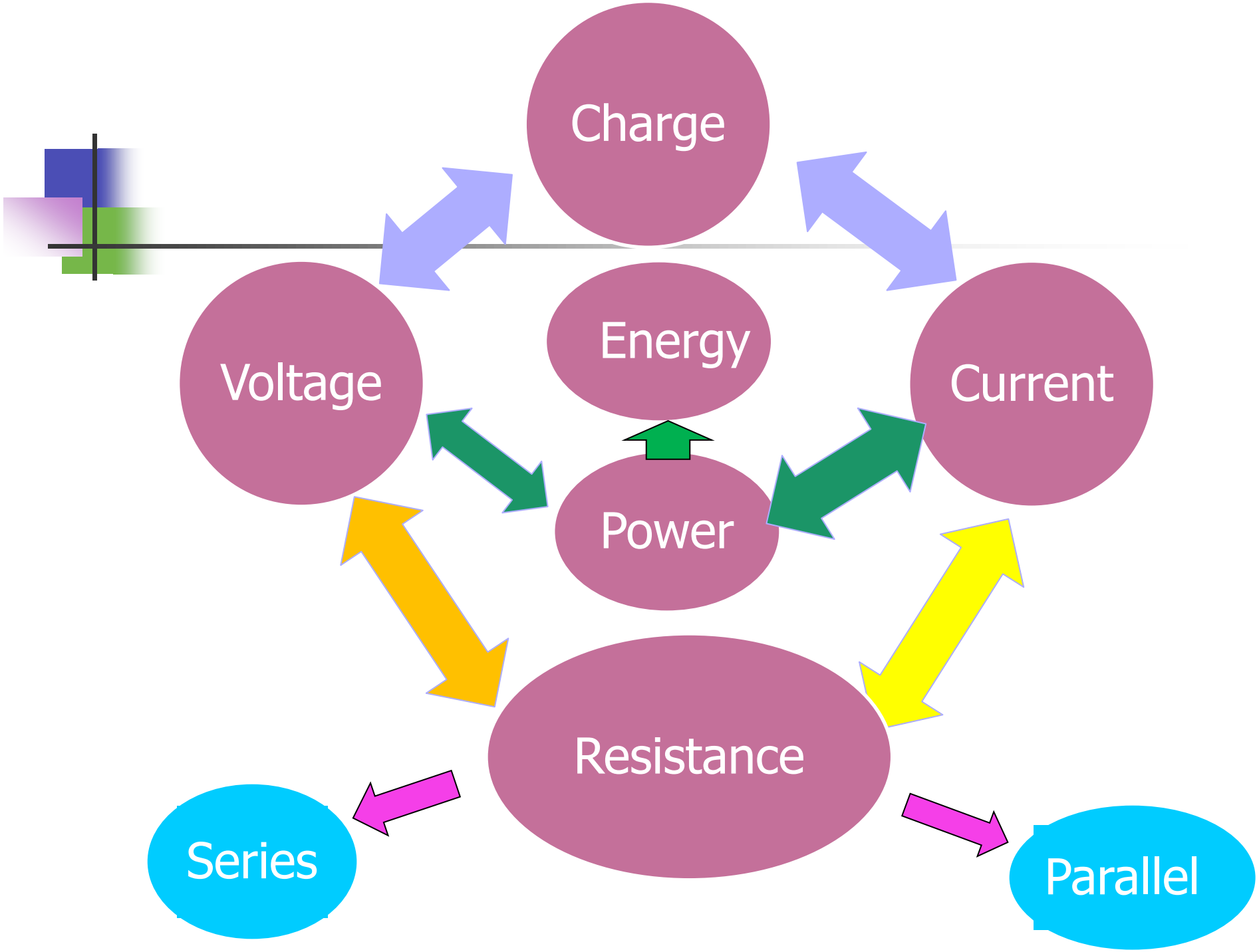
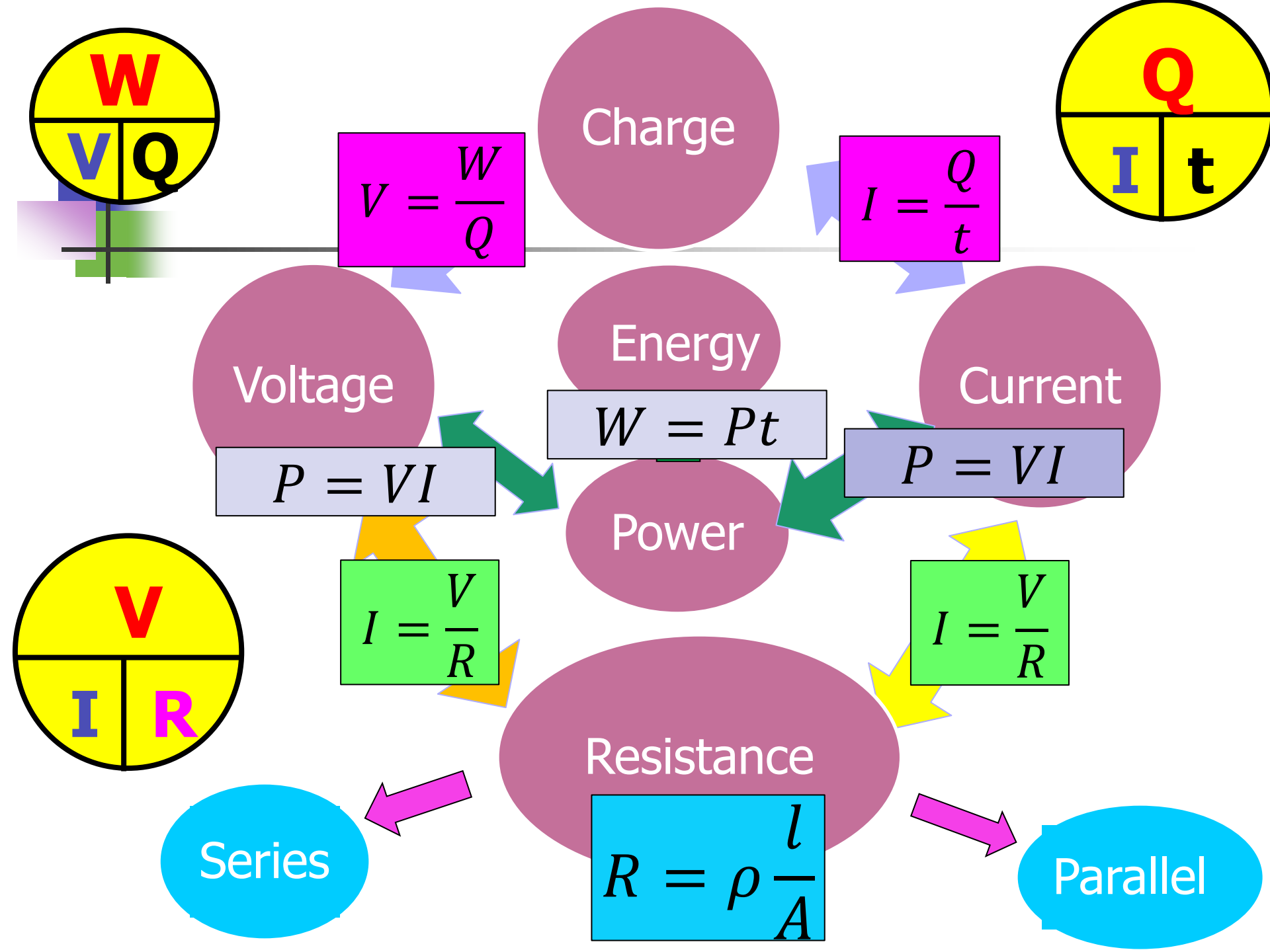
Key points

- Basic concept
  - Unit, unit conversion, notations, power of ten
  - Current, voltage, power, energy
- Resistance
  - Measurements,
  - Ohm’s law
- Parallel and series circuit
  - Total resistance
  - Circuit analysis, CDR, VDR
  - KCL, KVL


Charge
Voltage
Energy
Current
Power
Resistance
Series
Parallel


W
V
Q
Charge
$V = \frac{W}{Q}$
$I = \frac{Q}{t}$
Q
I
t
Voltage
Energy
Current
$W = Pt$
$P = VI$
$P = VI$
Power
V
I
R
$I = \frac{V}{R}$
$I = \frac{V}{R}$
Resistance
$R = \rho \frac{l}{A}$
Series
Parallel

Parallel and series circuit

	Series	Parallel
Definition	One node in common and same current	Two nodes in common
Equivalent resistance	$R_T=R_1+R_2+\ldots+R_N$	$\frac{1}{R_T}=\frac{1}{R_1}+\frac{1}{R_2}+\cdots+\frac{1}{R_N}$ $G_T = G_1 + G_2 + G_3 + \cdots + G_N$
V & I	same current, voltage depends Ohm's law	same voltage, current depends Ohm's law
Rules	Voltage divider: $V_i = E\left(\frac{R_i}{R_T}\right)$	Current divider: $I_i = I\left(\frac{R_T}{R_i}\right)$
Kirchhoff's Law	KVL, closed path, $\Sigma V_i = 0$	KCL, single node, $\Sigma I_{in} = \Sigma I_{out}$