

TSA Electrical Applications

Study Resources

Part 1: Theory & Intro

Introduction

Starter Quizlet

Terms

SI Prefixes

peta-	P-	10^{15}	1 000 000 000 000 000	quadrillion	billiard
tera-	T-	10^{12}	1 000 000 000 000	trillion	billion
giga-	G-	10^9	1 000 000 000	billion	milliard
mega-	M-	10^6	1 000 000	million	
kilo-	k-	10^3	1 000	thousand	
hecto-	h-	10^2	100	hundred	
deca-	da-	10^1	10	ten	
		10^0	1	one	
deci-	d-	10^{-1}	0.1	tenth	
centi-	c-	10^{-2}	0.01	hundredth	
milli-	m-	10^{-3}	0.001	thousandth	
micro-	μ -	10^{-6}	0.000 001	millionth	
nano-	n-	10^{-9}	0.000 000 001	billionth	milliardth
pico-	p-	10^{-12}	0.000 000 000 001	trillionth	billionth
femto-	f-	10^{-15}	0.000 000 000 000 001	quadrillionth	billiardth

A few standard units

Time: seconds (s)

Voltage: volts (V)

Charge: coulomb (C)

Current: amps (A); $1\text{ A} = 1\frac{\text{C}}{\text{s}}$

Energy: joules (J); $1\text{ J} = 1\text{ V} \cdot \text{C}$

Power: watts (W); $1\text{ W} = 1\frac{\text{J}}{\text{s}}$

Mass: kilogram (kg)

Frequency: hertz (Hz); $1\text{ Hz} = 1\frac{\text{cycle}}{\text{s}}$

$$\text{Voltage} = \text{Current} \times \text{Resistance}$$
$$\text{Current} = \frac{\text{Voltage}}{\text{Resistance}}$$
$$\text{Resistance} = \frac{\text{Voltage}}{\text{Current}}$$

Introduction to Electronics

Components in Schematics Reference

Resistor Networks

Circuits Introduction

Multimeter Usage

Optional Resource

Part 2: Circuits and Breadboarding

Breadboarding Overview

Series vs Parallel

You will have to practice this with a real breadboard in person 😊

Purchase List

- a. (Minimum) 1.375" x 3.25" solderless circuit breadboard 10 x 30 pin positions
- b. One (1) 9-volt battery with snap-on battery connector
- c. One (1) speaker (wires pre-soldered)
- d. Two (2) LEDs
- e. Twelve (12) connector wires
- f. Pushbutton switch (wires pre-soldered)
- g. One (1) photocell
- h. One (1) potentiometer
- i. One (1) IN4003 diode
- j. One (1) IC555 integrated circuit
- k. One (1) 2N3906 transistor
- l. One (1) 2N3904 transistor
- m. Resistors (minimum of one [1] each, ohms): 10, 10K, 47, 100, 220, 1K, 2.2K, 3.3K, 6.8K, 16K, 33K, 120K, 330, 470K
- n. Capacitors (in microfarads): .01, .1, 10, 100, 1000
- o. S106B1 SCR
- p. Wire strippers
- q. Standard 4-function calculator (scientific calculators will not be permitted)
- r. Digital multimeter