VNR VIGNANA JYOTHI INSTITUTE OF ENGINEERING & TECHNOLOGY
BASIC ELECTRICAL ENGINEERING LABORATORY
(Common to CSE and IT)

COURSE OBJECTIVES:

- To understand the construction of electrical equipment and operation of electronic devices
- To recognize different circuit reduction techniques
- To practice the techniques to control and assess electrical machines
- To know different electric safety measures

COURSE OUTCOMES:

After completion of the course, the student will be able to

- CO-1: Identify different parts of electrical equipment and appreciate their purpose
- CO-2: Apply different network reduction techniques to solve and analyze electrical circuits
- CO-3: Realize the compatibility of electrical machines in different engineering fields
- CO-4: Control different electrical machines and evaluate their performance
- CO-5: Appreciate the operation of various electronic devices

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PART – A

1. Demonstration of Safety Precautions, Measuring instruments, Electrical and Electronic Components.

2. Identification of Ratings of resistors using color codes and Electrical circuit bread board practice

3. Demonstration of Cut-out sections of DC Motor, Induction Motor and Alternator.

4. Demonstration of LT Switchgear Components.

5. Demonstration of various converters and UPS. 6. Demonstration and study of Step response using Automatic Data Acquisition.

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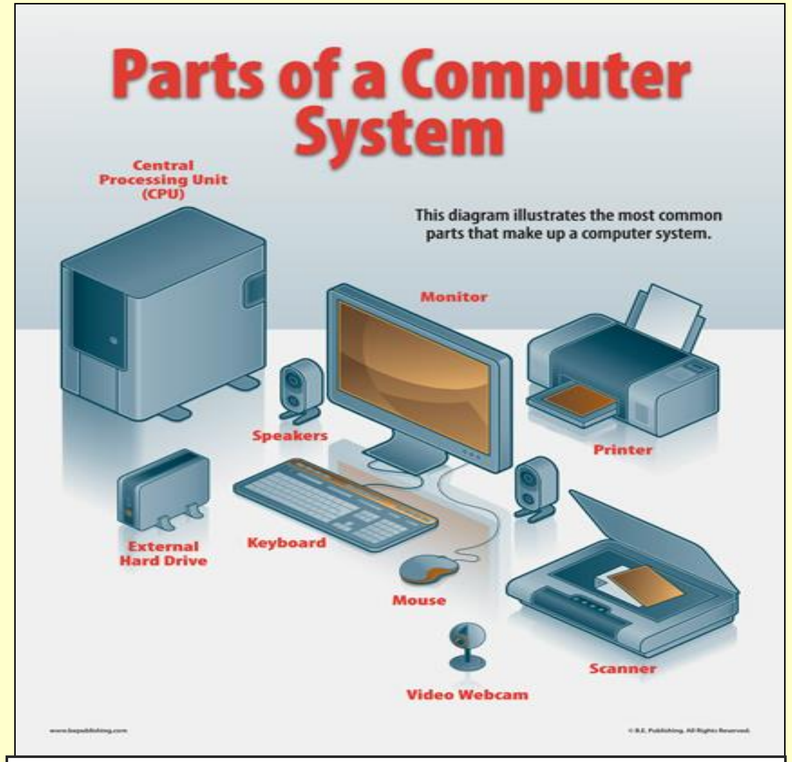
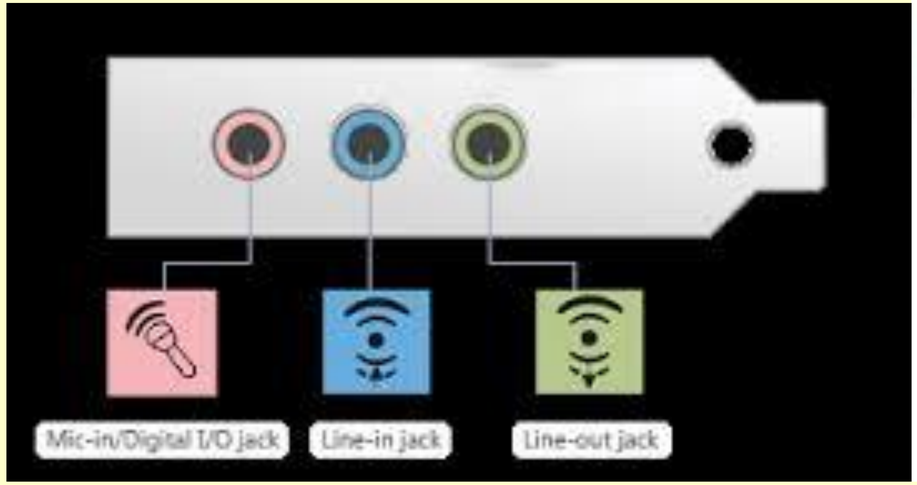
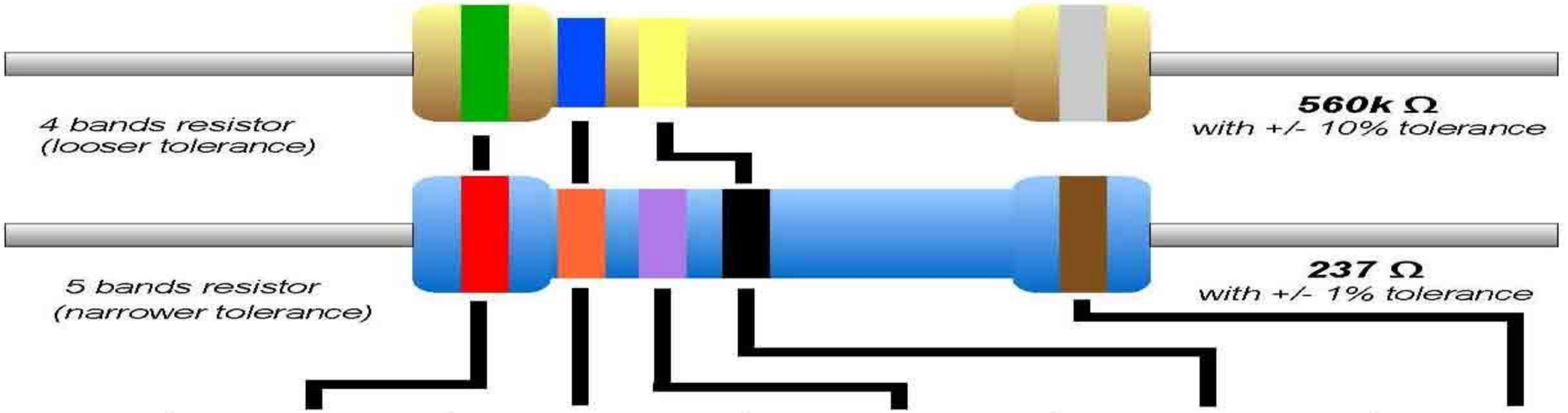
PART – B

1. Verification of KVL & KCL.
2. Verification of Superposition Theorem.
3. Time Response of RC and RL circuits.
4. Analysis of series RL, RC and RLC circuits
5. Load test on 1- ϕ Transformer
6. Speed control of DC shunt Motor.
7. Torque Speed Characteristics of Separately Excited DC motor.
8. Brake test on 3- ϕ Induction Motor.
9. Control of Synchronous generator voltage through its field excitation.
10. Constant Voltage and Constant Current charging of Batteries.
11. P-N Diode Characteristics and Full wave rectifier
12. Transistor CE Characteristics (Input and Output)


Parts of a Computer System
Central Processing Unit (CPU)
This diagram illustrates the most common parts that make up a computer system.
Monitor
Speakers
Printer
External Hard Drive
Keyboard
Mouse
Scanner
Video Webcam

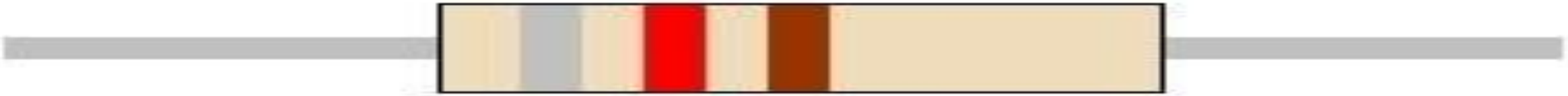

Mic-in/Digital I/O jack
Line-in jack
Line-out jack

Resistor Color Code



Color	1st Band	2nd Band	3rd Band	Multiplier	Tolerance
Black	0	0	0	x 1 Ω	
Brown	1	1	1	x 10 Ω	+/- 1%
Red	2	2	2	x 100 Ω	+/- 2%
Orange	3	3	3	x 1K Ω	
Yellow	4	4	4	x 10K Ω	
Green	5	5	5	x 100K Ω	+/- .5%
Blue	6	6	6	x 1M Ω	+/- .25%
Violet	7	7	7	x 10M Ω	+/- .1%
Grey	8	8	8		+/- .05%
White	9	9	9		
Gold				x .1 Ω	+/- 5%
Silver				x .01 Ω	+/- 10%

Resistor colour codes

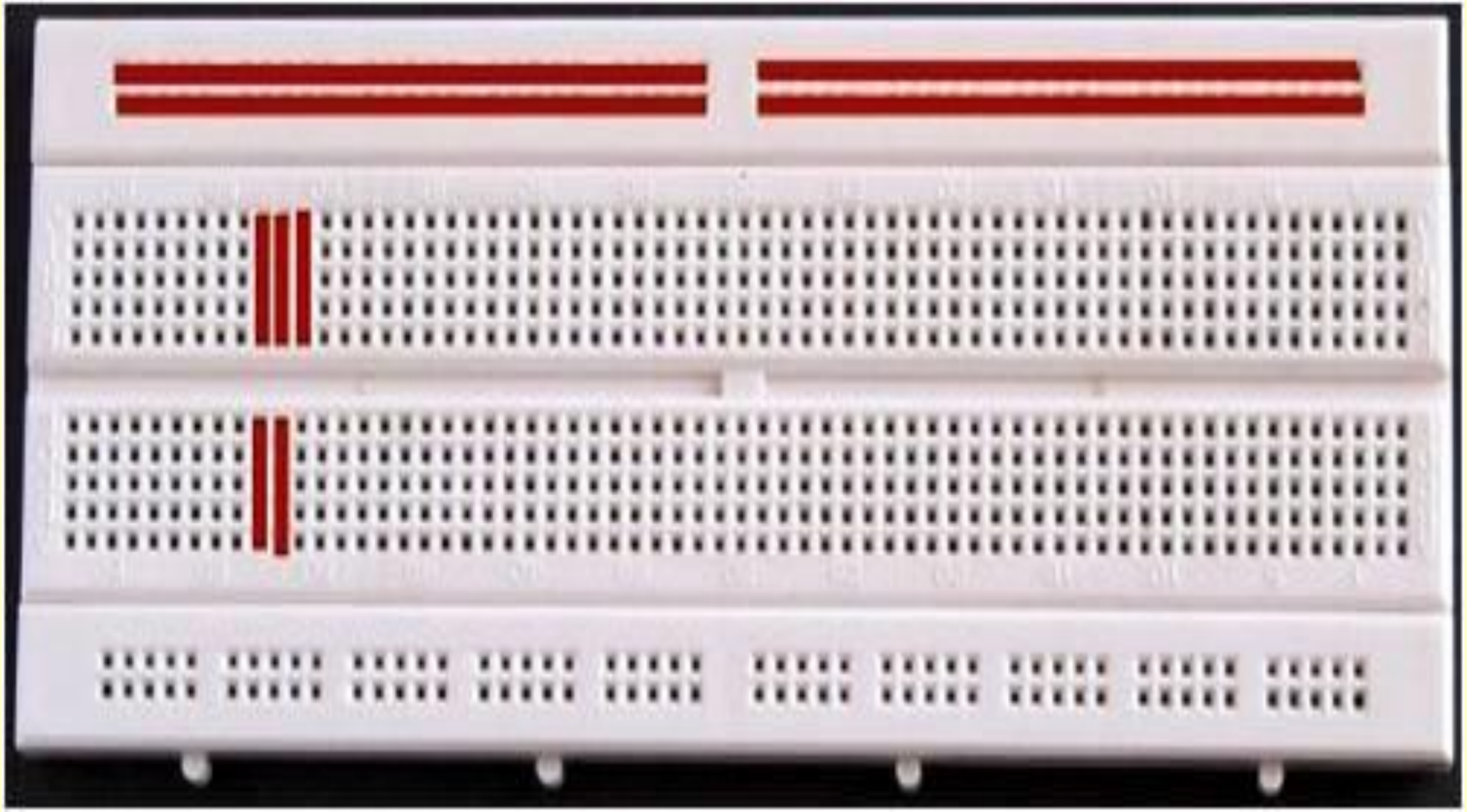


Example
Grey + Red + Brown
= 8 2 x10
= 820r

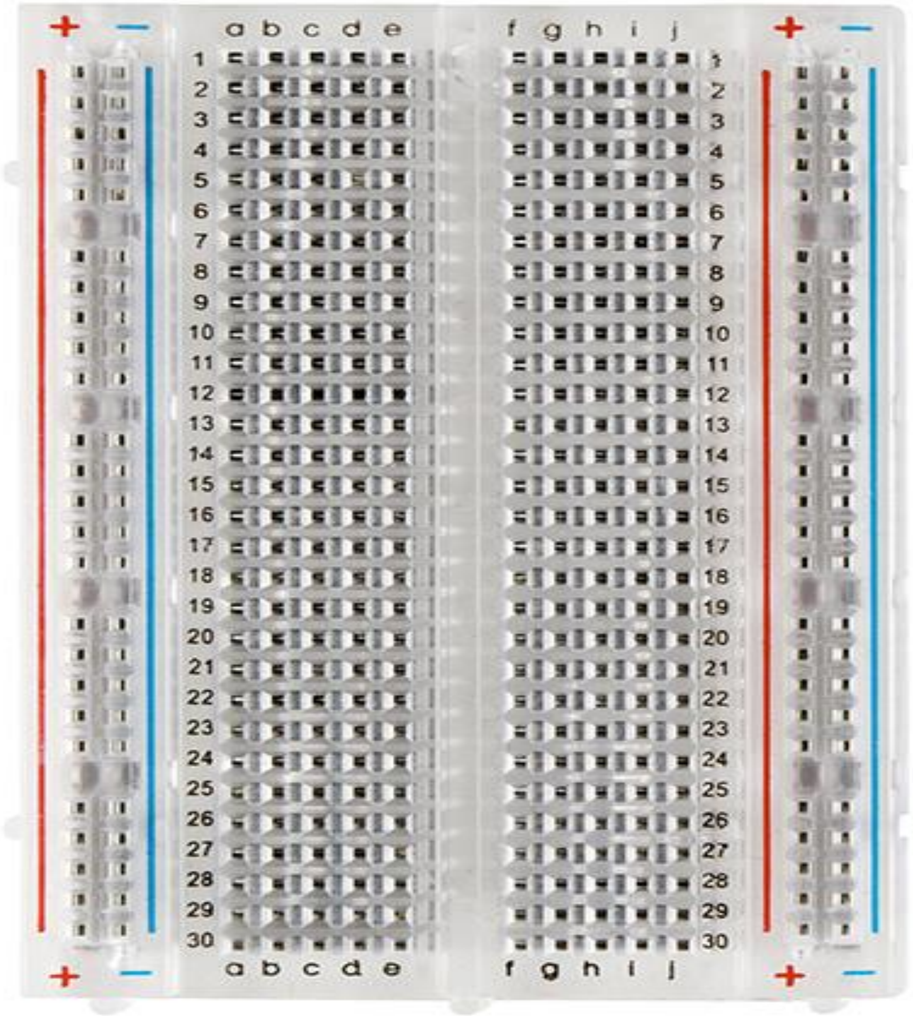
Black >	0	0	x1
Brown >	1	1	x10
Red >	2	2	x100
Orange >	3	3	x1000
Yellow >	4	4	x10000
Green >	5	5	x100000
Blue >	6	6	x1000000
Purple >	7	7	
Grey >	8	8	-
White >	9	9	-

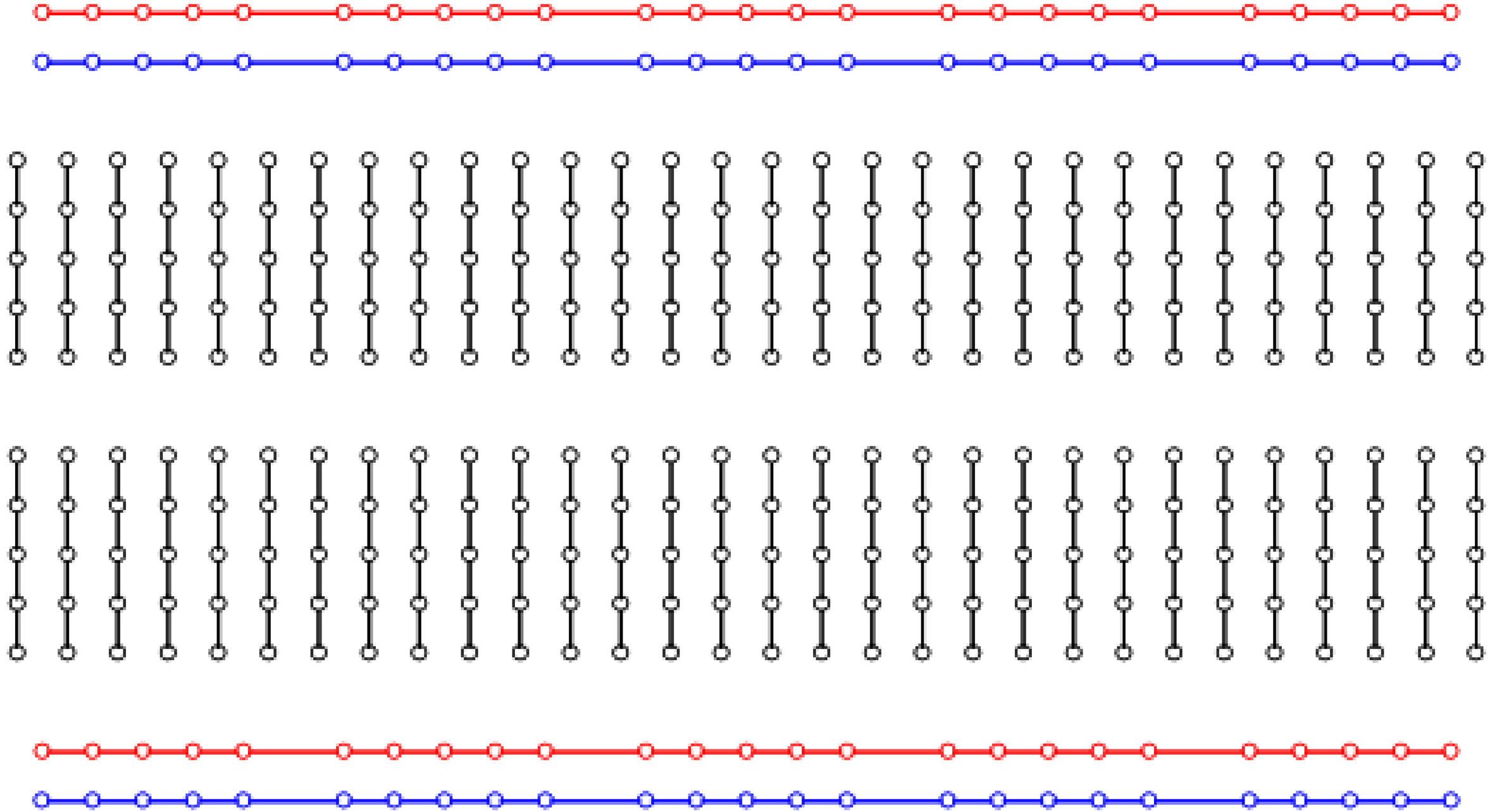
READING RESISTOR CODE

	1st	2nd	3rd	Multiplier	Tolerence
Silver				10^{-2}	±10%
Gold				10^{-1}	±5%
Black	0	0	0	10^{0}	
Brown	1	1	1	10^{1}	±1%
Red	2	2	2	10^{2}	±2%
Orange	3	3	3	10^{3}	
Yellow	4	4	4	10^{4}	
Green	5	5	5	10^{5}	±0.5%
Blue	6	6	6	10^{6}	±0.25%
Purple	7	7	7	10^{7}	±0.1%
Grey	8	8	8		
White	9	9	9		

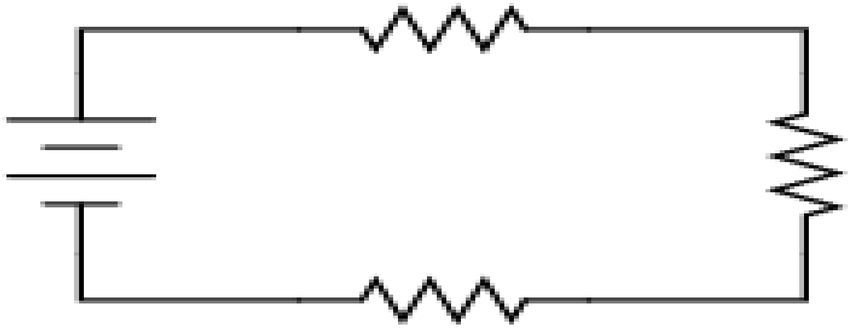


BREAD BOARD

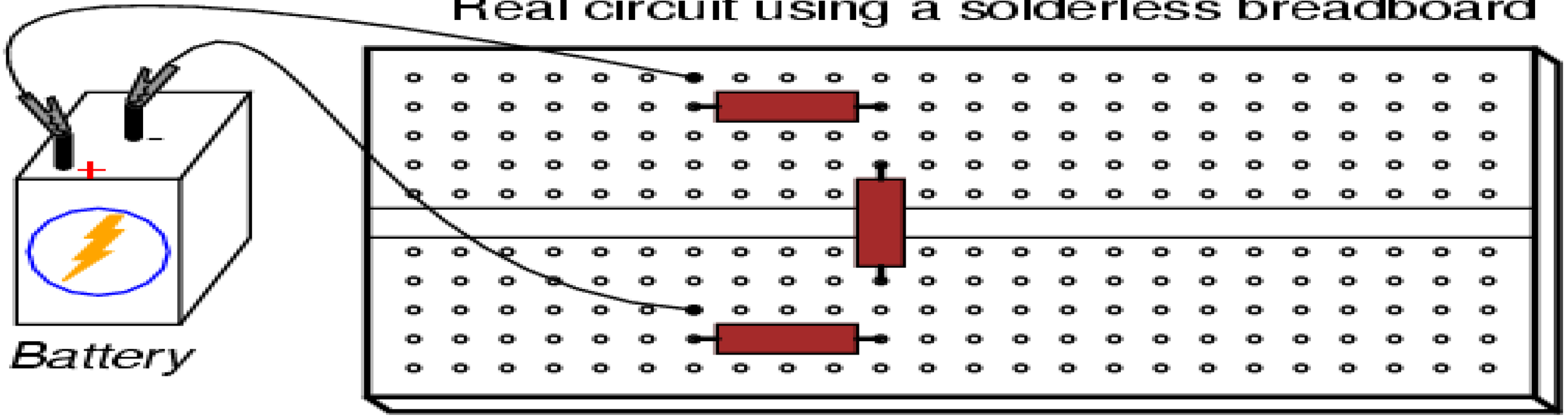

+
−
a b c d e
f g h i j
1 2 3 4 5 6 7 8 9 10 11 12 13 14 15 16 17 18 19 20 21 22 23 24 25 26 27 28 29 30



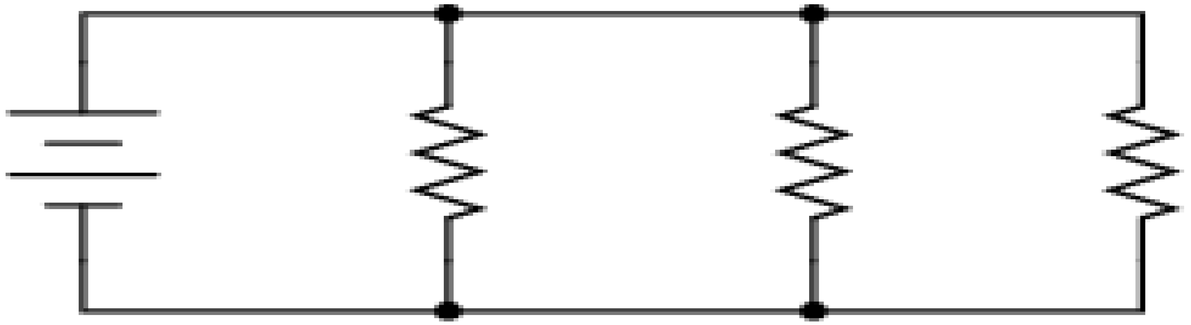
Schematic diagram



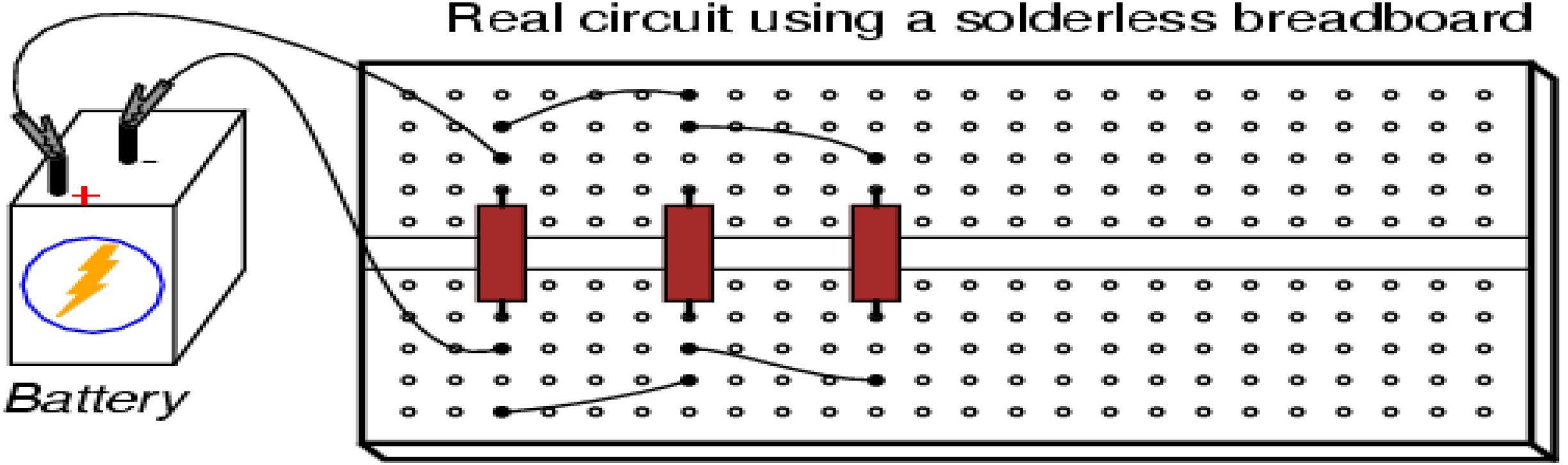
Real circuit using a solderless breadboard



Schematic diagram



Real circuit using a solderless breadboard



REGULATED POWER SUPPLY

DECADE RESISTANCE BOX


0.00
BACK LIGHT
OFF
600
200
20
2
200m
2M
200k
20k
2k
200
10
200µ
2m
20m
200m
hFE
NPN
PNP
MAX600V
500mA MAX FUSE
10A MAX
COM
Volmate
Peak
POWER
HEAVY DUTY
0% MERCURY
1604E 6F22 9V

AMMETER

VOLTMETER

FUNCTION GENERATOR