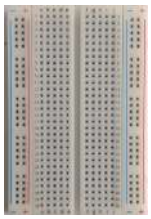
(Student Name) (Period/Student Number) (Date)

QUIZ for Lesson 1 in the Mr Circuit Lab 1
or in STEM KIT #00 for Mr Circuit Electronics Training

QUIZ for Lesson 1 - "Electron Theory"



Circle the letter for your answer to each question and then hand this quiz in to your teacher.

A B C D

#1 Everything around you is made of _____ .

A. wood
B. matter
C. steel
D. water

A B C D

#2 Matter is made up of _____ .

A. water
B. steel
C. elements
D. wood

A B C D

#3 Atoms are what make up _____ .

A. elements
B. protons
C. electrons
D. neutrons

A B C D

#4 In the nucleus of _____ are protons and neutrons.

A. an electron
B. a proton
C. an atom
D. a neutron

A B C D

#5 The movement of electrons from atom to atom is called _____ .

A. an electron current
B. an electron charge
C. an electron resistance
D. a neutron flow

A B C D

#6 Atoms have a central core called _____ .

A. a middle section
B. a nucleus
C. a slice
D. a modecum

A B C D

#7 What are the positively charged particles in an atom called?

A. protons
B. products
C. add ons
D. neutrons

A B C D

#8 A particle in an atom that has no electrical charge is called _____ .

A. a nothing
B. a widget
C. a neutron
D. an axion

A B C D

#9 The part of Physics that studies the movement of electrons is called _____ .

A. resistance
B. conductance
C. capacitance
D. electronics

A B C D

#10 What circulates through the filament of an incandescent bulb to make it light up?

A. electrons
B. magnets
C. protons
D. neutrons

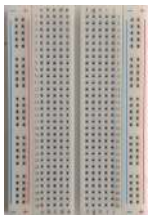
(Form SQ00-1)

Score

(Student Name) (Period/Student Number) (Date)

QUIZ for Lesson 2 in the Mr Circuit Lab 1 or in STEM KIT #00 for Mr Circuit Electronics Training

QUIZ for Lesson 2 - "Component Identification"



Circle the letter for your answer to each question and then hand this quiz in to your teacher.

A B C D

#1 What is the primary function of a battery in a circuit?

A. store electric energy
B. serve as a paper weight
C. give resistance to a circuit
D. amplify electricity

A B C D

#2 What is the primary function of a resistor?

A. resist proton flow
B. add color to your circuit
C. count electrons
D. limit or control current

A B C D

#3 What is the primary function of an LED?

A. control electron flow
B. light up when current flows through it
C. provide heat to keep you warm
D. store electrons

A B C D

#4 Which set of components has a schematic symbol that includes a 'squiggly' line?

A. a resistor, a photocell, and a potentiometer
B. a capacitor and an SCR
C. an LED and a Battery
D. an Integrated Circuit and a Speaker

A B C D

#5 Which of these has a 'diode symbol' as part of its symbol?

A. a Diode
B. an SCR
C. an LED
D. All the above

A B C D

#6 Which type of capacitor generally stores relatively large amount of electric charge?

A. a ceramic disc capacitor
B. an electrolytic capacitor
C. a surface mount capacitor
D. a mica capacitor

A B C D

#7 What component varies its resistance according to the light intensity?

A. a Photocell
B. a Transistor
C. a 555 Timer IC
D. an SCR

A B C D

#8 What component has an Emitter, Base, and Collector?

A. a Transistor
B. an SCR
C. a Diode
D. a Potentiometer

A B C D

#9 Which of these component has a Gate, an Anode, and a Cathode lead?

A. an SCR
B. a Transistor
C. a Diode
D. a Resistor

A B C D

#10 What is the purpose of a speaker?

A. convert electrical currents into sound waves
B. use power
C. be an adjustable capacitor
D. take up space in a circuit

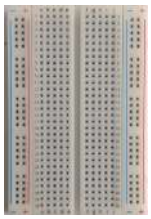
(Form SQ00-2)

Score

(Student Name) (Period/Student Number) (Date)

QUIZ for Lesson 3 in the Mr Circuit Lab 1 or in STEM KIT #00 for Mr Circuit Electronics Training

QUIZ for Lesson 3 - "Resistor Color Code"



Circle the letter for your answer to each question and then hand this quiz in to your teacher.

A B C D

#1 A resistor of 10,000 Ohms has _____ than a resistor of 1,000 Ohms.

A. less opposition to current flow
B. more opposition to current flow
C. less Ohms
D. larger physical size

A B C D

#2 Resistance in electronics is the _____ .

A. encouragement to current flow
B. not important
C. opposition to current flow
D. storage of electrons

A B C D

#3 The fourth color band on a ±5% resistor is what color?

A. gold
B. silver
C. black
D. red

A B C D

#4 Why do we put color bands on resistors?

A. because numbers would be very small
B. because colors make the circuit work better
C. electronics likes many colors
D. to test for colorblindness

A B C D

#5 What is the purpose for the Resistor Color Code?

A. to hide the value of the resistor
B. to determine the Ohms of the resistor
C. to add color to the circuit
D. to make it hard to read the value in Ohms

A B C D

#6 What does the color green stand for in the Resistor Color Code?

A. 5
B. 9
C. 0
D. 3

A B C D

#7 What is the value in Ohms of a resistor with color bands of yellow, violet, black, gold?

A. 55,000 Ohms
B. 360 Ohms
C. 47 Ohms
D. 68k Ohms

A B C D

#8 If the fourth or last band on a resistor is the color silver, what is the tolerance?

A. ±10%
B. ±5%
C. ±3%
D. ±2%

A B C D

#9 There are four bands on a ±5% resistor. The first two colors represent _____ .

A. alpha numerics
B. alpha characters
C. negative numbers
D. numerals

A B C D

#10 In the Resistor Color Code, what is the color that represents '2'?

A. Orange
B. Violet
C. Red
D. Black

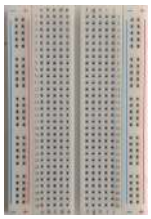
(Form SQ00-3)

Score

(Student Name) (Period/Student Number) (Date)

QUIZ for Lesson 4 in the Mr Circuit Lab 1 or in STEM KIT #00 for Mr Circuit Electronics Training

QUIZ for Lesson 4 "Solderless Circuit Board"



Circle the letter for your answer to each question and then hand this quiz in to your teacher.

A B C D

#1 Why do we use a Solderless Circuit Board to assemble circuits?

A. to make the circuit more permanent
B. to add more resistance to the circuit
C. to slow down the electrons
D. to make connections without soldering

A B C D

#2 What is the purpose of the channel down the middle of the solderless circuit board?

A. to be able to install Integrated Circuits
B. to release moisture from the circuit
C. to separate resistors from capacitors
D. to count the components in the circuit

A B C D

#3 Each hole in a 'vertical group' or set of 5 holes is _____ .

A. not connected electrically
B. full of high resistance
C. electrically connected
D. has a high voltage

A B C D

#4 A Solderless Circuit Board is _____ .

A. not reusable
B. reusable
C. never used by technicians and engineers
D. difficult to find

A B C D

#5 How many sets of 5 holes are there on the Solderless Circuit Board provided?

A. 22
B. 660
C. 500
D. 60

A B C D

#6 Each hole in the Solderless Circuit Board is designed to accept how many wires or leads?

A. 1
B. 5
C. 3
D. 14

A B C D

#7 On the Solderless Circuit Board, an Integrated Circuit is installed _____ . .

A. anywhere you like
B. on one side of the other
C. hanging off the edge of the board
D. straddling the center channel

A B C D

#8 Inside the holes in the Solderless Circuit Board are clips made of _____ .

A. plastic
B. wood
C. metal
D. pvc material

A B C D

#9 Why are there numbers and letters on the Solderless Circuit Board?

A. for decoration
B. to practice counting
C. to identify each and every hole
D. for no real purpose

A B C D

#10 The 5 holes in a vertical group on a Solderless Circuit Board are all _____ .

A. shorted together
B. not shorted together
C. are insulated from each other
D. are glued together

(Form SQ00-4)

Score

(Student Name) (Period/Student Number) (Date)

QUIZ for Exp 01 or STEM KIT #01
in the Mr Circuit Electronics Training Lab 1

This Quiz covers the training learned by completing

"How a Resistor Works" Experiment 1

Circle the letter for your answer to each question and then hand this quiz in to your teacher.

A B C D

#1 In Experiment #1, the brightness of the LED depends on _____ .

A. the capacitor value in the circuit
B. the value of the resistor in the circuit
C. the solderless circuit board
D. the battery snap

A B C D

#2 Of the four values of resistors in Exp. #1, which value caused the LED to be the brightest?
A. 100 ohm
B. 220 ohm
C. 1k ohm
D. 6.8k ohm

A B C D

#3 What color is the third band on the 6.8k ohm resistor?

A. blue
B. green
C. black
D. red

A B C D

#4 Which side of battery does the electron current flow from?

A. positive side
B. left side
C. negative side
D. top side

A B C D

#5 What is the color of the positive lead on the battery snap?

A. green
B. red
C. black
D. yellow

A B C D

#6 The short lead on an LED is?

A. the Gate
B. the Anode
C. the Cathode
D. the Positive

A B C D

#7 What are the colors on a 1000 Ohm ±5% resistor?

A. brown, black, red, gold
B. green, blue, red, silver
C. blue, gray, red, gold
D. brown, red, green silver

A B C D

#8 With an LED in a circuit, the more _____, the greater the brightness.
A. air
B. capacitance
C. current
D. light

A B C D

#9 To reduce the amount of current flowing in a circuit, you can _____ the amount of resistance.
A. increase
B. decrease
C. rotate
D. circle

A B C D

#10 Of the four values of resistors in Exp. #1, which value caused the LED to be the dimmest?
A. 100 ohm
B. 220 ohm
C. 1k ohm
D. 6.8k ohm

(Form SQ01)

Score	

(Student Name) (Period/Student Number) (Date)

QUIZ for Exp 02 or STEM KIT #02
in the Mr Circuit Electronics Training Lab 1

This Quiz covers the training learned by completing

"How a Potentiometer Works" Experiment 2

Circle the letter for your answer to each question and then hand this quiz in to your teacher.

A B C D

#1 Between which leads on the Potentiometer in Experiment #02 does the resistance measure the maximum?
A. leads A and B
B. leads A and C
C. leads C and B
D. there is no maximum resistance

A B C D

#2 The 'cursor' on the Potentiometer is connected to which lead?

A. C
B. A
C. it is not connected to any lead
D. B

A B C D

#3 The resistance value of the Potentiometer is zero when the 'cursor' is moved next to which lead?
A. B
B. A
C. black
D. C

A B C D

#4 Does the polarity of the battery connection matter in this circuit?

A. NO
B. it is not important
C. YES
D. the LED will light up either way

A B C D

#5 In Exp. #2, what is the name of the electronic component that you are learning about?
A. the Potentiometer
B. an LED
C. a capacitor
D. a battery snap

A B C D

#6 What is the function of the Potentiometer in Exp. #2?

A. to vary the capacitance in the circuit
B. to reduce proton flow
C. to slow down the speed of the electrons
D. to vary the resistance in the circuit

A B C D

#7 In Exp. #2, what is the purpose of the 100 ohm resistor in the circuit?

A. to protect the LED from burning out
B. to increase the amount of current flowing
C. to make the circuit more interesting
D. to increase the parts used in the circuit

A B C D

#8 When you twist the shaft on a Potentiometer, it varies its _____ .

A. resistance
B. capacitance
C. area
D. wattage

A B C D

#9 To set the Potentiometer at its maximum resistance you have to move the 'cursor' next to which lead?
A. B
B. A
C. black
D. C

A B C D

#10 The LED is the brightest when the 'cursor' on the Potentiometer is next to which lead?

A. B
B. A
C. black
D. C

(Form SQ02)

Score	

(Student Name) (Period/Student Number) (Date)

QUIZ for Exp 03 or STEM KIT #03
in the Mr Circuit Electronics Training Lab 1

This Quiz covers the training learned by completing

"How a Photocell Works" Experiment 3

Circle the letter for your answer to each question and then hand this quiz in to your teacher.

A B C D

#1 How many leads does a Photocell have?

A. 1
B. 2
C. 3
D. 6

A B C D

#2 Does a Photocell have polarity?

A. YES
B. NO
C. maybe
D. not necessarily

A B C D

#3 In order for a Photocell to vary its resistance, light has to hit the _____.

A. top surface
B. bottom surface
C. the leads
D. the left side

A B C D

#4 If you reverse the leads on the battery snap, how will that affect the circuit?

A. the LED will be brighter
B. the circuit will work just fine
C. the LED will get hot and burn up
D. the LED will not light up

A B C D

#5 If you put this circuit into a dark room, how will that affect the LED brightness?

A. it will be super bright
B. it will burn out
C. it will be dimmer
D. it will be the same as in bright light

A B C D

#6 This circuit has three components. They are the battery snap, a resistor, and a _____ .

A. Photocell
B. Potentiometer
C. capacitor
D. microphone

A B C D

#7 In this experiment, what do we use to shield the light from hitting the Photocell?

A. a flashlight
B. a fork
C. a hand
D. a forklift

A B C D

#8 A Photocell changes its resistance because it is sensitive to _____.

A. air
B. pressure
C. gravity
D. light

A B C D

#9 When you block the amount of light hitting a Photocell, its resistance _____ .

A. is not affected
B. decreases
C. causes more capacitance in the circuit
D. increases

A B C D

#10 How does the brightness of the light that hits the Photocell affect the LED in the circuit?

A. has no effect at all
B. brighter the light, brighter the LED
C. LEDs don't get brighter or dimmer
D. dimmer the light, brighter the LED

(Form SQ03)

Score

(Student Name) (Period/Student Number) (Date)

QUIZ for Exp 04 or STEM KIT #04
in the Mr Circuit Electronics Training Lab 1

This Quiz covers the training learned by completing

"How a Capacitor Works" Experiment 4

Circle the letter for your answer to each question and then hand this quiz in to your teacher.

A B C D

#1 In Experiment #4, what is the component that you learned about?

A. a capacitor
B. a resistor
C. an LED
D. a battery snap

A B C D

#2 In Exp. #4, how many resistors do we use?

A. 1
B. 2
C. 3
D. 4

A B C D

#3 In Exp. #4, when you disconnect the battery, the LED remains lit for a time because _____.

A. the two resistors keep it lit
B. the energy stored in the capacitor keeps it lit
C. LEDs store electrons
D. your eyes are playing tricks on you.

A B C D

#4 What happens to the LED when we reduce the value of the capacitor in the circuit and then disconnect the battery?

A. The LED remains lit for a longer time.
B. The LED will burn out.
C. The LED remains lit for shorter time.
D. It will have no effect on the LED.

A B C D

#5 In Exp. #4, what type of capacitor are we using?

A. an electrolytic capacitor
B. a ceramic disc capacitor
C. a polyester film capacitor
D. a variable capacitor

A B C D

#6 What happens to the LED if we reverse the polarity on the battery?

A. it lights up just fine
B. it burns out the LED
C. the LED will not light up
D. the LED will get hot

A B C D

#7 The more capacitance a capacitor has, the _____ electrical charge it will hold.

A. less
B. fuzzier
C. worse
D. more

A B C D

#8 Which value of capacitor will hold more electrical charge?

A. 1000uF
B. 100uF
C. 10uF
D. 1uF

A B C D

#9 What is the purpose of a capacitor in a circuit?

A. to vary the resistance
B. to store inductance
C. to store an electrical charge
D. to increase the wattage

A B C D

#10 Does the capacitor in this circuit have polarity?

A. NO
B. can't tell
C. YES
D. its an inductor

A B C D

(Form SQ04)

Score	

(Student Name) (Period/Student Number) (Date)

QUIZ for Exp 05 or STEM KIT #05
in the Mr Circuit Electronics Training Lab 1

This Quiz covers the training learned by completing

“How a Speaker Works” Experiment 5

Circle the letter for your answer to each question and then hand this quiz in to your teacher.

#1 What would happen in this circuit if you reverse the polarity of the battery snap?

A. the speaker will burn out
B. it will not work at all
C. the speaker will whistle
D. it will work just fine

#2 What do you think the purpose of the 10 Ohm resistor is in this circuit?

A. to increase the amount of current
B. to reduce the amount of current
C. to increase the capacitance
D. to decrease the inductance

#3 When you reverse the polarity of the battery snap in this circuit, it affects the _____ of the speaker.

A. cone
B. magnet
C. volume
D. sound quality

#4 Why does the sound stop when you leave the battery connected?

A. the magnet gets weak
B. the speaker burns out
C. the cone stops moving
D. the current increases

#5 Why does the speaker make a ‘click’ when you connect and when you disconnect the battery?

A. the cone moves each time
B. the speaker is alive
C. the magnet is weak
D. the speaker is round

#6 What is the name of the part we learn about in Exp. #5?

A. a speaker
B. a capacitor
C. a resistor
D. a photocell

#7 What is the function of the part we learn about in Exp. #5?

A. reduce the amount of current flow
B. to store electrons and protons
C. transform electrical energy to sound waves
D. to look nice in a circuit

#8 What part of a Speaker moves when current flows through it?

A. the bracket
B. the magnet
C. the handle
D. the cone

#9 What sound comes out of a speaker when a steady DC current is connected to its coil?

A. it makes a steady tone
B. it makes a click and then becomes silent
C. it plays music
D. it sounds like a siren

#10 What kind of device is a Speaker?

A. rectifying device
B. electromechanical device
C. photoelectric device
D. semiconductor device

(Form SQ05)

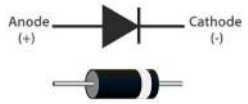
Score

(Student Name) (Period/Student Number) (Date)

QUIZ for Exp 06 or STEM KIT #06
in the Mr Circuit Electronics Training Lab 1

This Quiz covers the training learned by completing

"How a Diode Works" Experiment 6



Circle the letter for your answer to each question and then hand this quiz in to your teacher.

#1 In Experiment #6, what is the component that you learned about?

A. a capacitor
B. a diode
C. an LED
D. a battery snap

#2 A diode allows current to flow through it _____ .

A. freely both ways
B. in one direction only
C. if it is warm
D. only if there is a resistor in the circuit

#3 How is the Cathode side of a diode marked on the diode itself?

A. with a double color stripe
B. with an arrow
C. with a white band around one end
D. with an asterisk

#4 A diode allows an easy flow of electrons from _____ to _____ .

A. top, bottom
B. bottom, top
C. Anode, Cathode
D. Cathode, Anode

#5 In Exp. #6, what component do we use to indicate that current is flowing?

A. a speaker
B. an LED
C. an electrolytic capacitor
D. a disc capacitor

#6 The arrow on the schematic symbol for a diode points to the _____ .

A. Anode
B. Gate
C. Door
D. Cathode

#7 An LED is also a type of _____ .

A. inductor
B. diode
C. capacitor
D. speaker

#8 If we were to increase the value of the resistor in the circuit from 220 Ohms to 1000 Ohms, how would that affect the LED?

A. the LED would increase its brightness
B. the LED would reduce in brightness
C. the current flow in the LED would increase
D. the brightness would stay the same

#9 If the LED lights up the same regardless of the polarity of the diode in the circuit, what would we assume?

A. the LED is defective
B. the diode is working fine
C. the battery is weak
D. the diode is defective

#10 A diode is considered a _____ .

A. simple resistor
B. one-way gate
C. a variable resistor
D. a simple capacitor

Packet (Form SQ06)

Score

(Student Name) (Period/Student Number) (Date)

QUIZ for Exp 07 or STEM KIT #07
in the Mr Circuit Electronics Training Lab 1

This Quiz covers the training learned by completing

"How an SCR (Silicon Control Rectifier) Works" Exp. 7

Circle the letter for your answer to each question and then hand this quiz in to your teacher.

#1 What are the three connections on an SCR?

A. Input, Output, and Neutral
B. Up, Down, Middle
C. Right, Left, Straight
D. Cathode, Anode, Gate

#2 Once an SCR is turned on, in order to turn it off, you need to _____ .

A. remove the voltage on the Gate
B. clap your hands
C. remove the power from the entire circuit
D. double the voltage

#3 Most of the electron current flowing through an SCR is flowing through the _____ .

A. Anode to Cathode circuit
B. the Gate circuit
C. Anode to Gate circuit
D. Cathode to Anode circuit

#4 To turn on an SCR in a circuit, you need a _____ .

A. large current on the Gate
B. small positive voltage on the Anode
C. small positive voltage on the Gate
D. large current on the Cathode

#5 The Gate lead on the SCR in this experiment is marked by the _____ .

A. metal tab on the SCR
B. left lead on the SCR
C. beveled edge on the SCR
D. center lead on the SCR

#6 The letters SCR in Exp. #7 stand for 'Silicon Controlled Rectifier'. How many connection leads does an SCR have?

A. 5
B. 4
C. 3
D. 2

#7 If a positive voltage is applied to the Gate of an SCR, what happens in the circuit?

A. the electrons flow through the SCR
B. the SCR will turn off
C. the resistance of the SCR increases
D. absolutely nothing

#8 The Anode lead is connected internally to the _____ on the SCR.

A. metal tab with a hole in it
B. to the Gate lead
C. to the Cathode lead
D. to the round edge on the SCR

#9 If we reverse the polarity of the battery snap in the circuit, what will happen?

A. it will not work
B. it will work just fine
C. the SCR will burn out
D. the LED will self-destruct

#10 An SCR is considered to be a _____ .

A. a variable resistor
B. a variable capacitor
C. "a diode with a difference"
D. a good potentiometer

(Form SQ07)

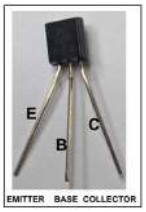
Score

(Student Name) (Period/Student Number) (Date)

QUIZ for Exp 08 or STEM KIT #08
in the Mr Circuit Electronics Training Lab 1

This Quiz covers the training learned by completing

"How an NPN Transistor Works" Experiment 8



Circle the letter for your answer to each question and then hand this quiz in to your teacher.

A B C D

#1 The NPN transistor we use in this experiment is referred to as a _____ transistor?
A. Bipolar
B. Dual
C. Double
D. integrated

A B C D

#2 The schematic symbol of an NPN Transistor shows an arrow pointing to the _____ lead.
A. cathode
B. emitter
C. base
D. collector

A B C D

#3 The leads on an NPN transistor are called the Emitter, Base, and _____ .
A. Collector
B. Cathode
C. Anode
D. Gate

A B C D

#4 Most of the current traveling through an NPN transistor travels through the _____ circuit.
A. Emitter-Base
B. Emitter-Collector
C. Base-Base
D. Cathode-Anode

A B C D

#5 In an NPN transistor, the direction of the electron flow is from _____ .
A. Base to Emitter
B. Base to Base
C. Emitter to Emitter
D. Emitter to Collector

A B C D

#6 In this NPN transistor circuit, which LED should conduct the most electron current?
A. LED 1
B. LED 2
C. LED 3
D. LED 4

A B C D

#7 In this circuit, the Cathode of LED 2 is connected to the _____ of the NPN transistor.
A. Collector
B. Base
C. Emitter
D. Gate

A B C D

#8 A transistor controls a large amount of current with _____ .
A. a small amount of current
B. a large amount of current
C. a small amount of voltage
D. a huge amount of voltage

A B C D

#9 An NPN transistor has three pins: a Collector, a Base, and _____ .
A. an Anode
B. an Emitter
C. a Cathode
D. a Gate

A B C D

#10 The process of having a small current controlling a large current is called _____ .
A. increase of the voltage
B. conservation of resources
C. reduction
D. amplification

(Form SQ08)

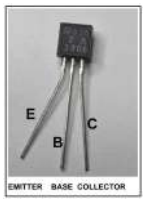
Score	

(Student Name) (Period/Student Number) (Date)

QUIZ for Exp 09 or STEM KIT #09
in the Mr Circuit Electronics Training Lab 1

This Quiz covers the training learned by completing

"How an PNP Transistor Works" Experiment 9



Circle the letter for your answer to each question and then hand this quiz in to your teacher.

A B C D

#1 In this circuit, the Emitter of the PNP is connected to the _____ of the battery.
A. negative
B. positive
C. neutral
D. ground

A B C D

#2 In Exp. #9, we use LED brightnesses to compare the amount of _____ flowing.
A. current
B. voltage
C. resistance
D. air

A B C D

#3 In a PNP transistor circuit, which current is greater?
A. the Collector to Emitter current
B. the Base to Emitter current
C. the Emitter to Collector current
D. the Emitter to Base current

A B C D

#4 In a transistor circuit, when there is no base current, there is _____ .
A. no voltage
B. more collector current
C. no collector current
D. no anode voltage

A B C D

#5 In Exp. #9, the PNP transistor is working as _____.
A. an amplifier
B. a voltage regulator
C. a resistor
D. a variable capacitor

A B C D

#6 The PNP transistor we use in this experiment is referred to as a _____ transistor?
A. Bipolar
B. Dual
C. Double
D. Integrated

A B C D

#7 The schematic symbol of a PNP Transistor shows an arrow pointing to the _____ lead.
A. Cathode
B. Emitter
C. Base
D. Collector

A B C D

#8 A transistor controls a large amount of current with _____ .
A. a small amount of current
B. a large amount of current
C. a small amount of voltage
D. a huge amount of voltage

A B C D

#9 A PNP transistor has three pins: a Collector pin, a Base pin, and _____ pin.
A. an Anode
B. an Emitter
C. a Cathode
D. a Gate

A B C D

#10 In a PNP transistor, the direction of the electron flow is from _____ .
A. Base to Base
B. Emitter to Collector
C. Emitter to Base
D. Collector to Emitter

(Form SQ09)

Score

(Student Name) (Period/Student Number) (Date)

QUIZ for Exp 10 or STEM KIT #10
in the Mr Circuit Electronics Training Lab 1

This Quiz covers the training learned by completing

"How a Two-Transistor Oscillator Works" Experiment 10

Circle the letter for your answer to each question and then hand this quiz in to your teacher.

A
B
C
D

#1 This two-transistor oscillator uses an NPN transistor and _____ .

A. an SCR
B. a PNP Transistor
C. a Diode
D. a Potentiometer

A
B
C
D

#2 In this two-transistor oscillator the Collector of transistor Q2 is connected to the Base of transistor Q1 through a _____ .

A. capacitor
B. resistor
C. wire
D. speaker

A
B
C
D

#3 In this two-transistor oscillator circuit, the Emitter of Q1 3904 is connected to the Base of transistor Q2 through a _____?

A. capacitor
B. resistor
C. wire
D. speaker

A
B
C
D

#4 If we reverse the polarity of the battery snap on the circuit, what will happen?

A. The circuit will not work.
B. It will work just fine.
C. The transistors will burn out.
D. The speaker will self-destruct.

A
B
C
D

#5 What happens if we increase the value of resistor R1 in the circuit?

A. it will increase the frequency
B. it will make no change in frequency
C. it will cause the speaker to jam
D. it will lower the frequency

A
B
C
D

#6 In Exp. #10, how many transistors do we use to make an oscillator?

A. 5
B. 4
C. 3
D. 2

A
B
C
D

#7 The circuit in Exp. #10 generates a tone by turning the _____ on and off at an audio frequency.

A. capacitor
B. speaker
C. battery
D. capacitance

A
B
C
D

#8 Generally, an audio signal (one that can be heard by your ears) is in what frequency range?

A. 1 million to 10 million (cycles per second)Hz
B. 10 Hz to 16,000 Hz
C. 100 thousand Hz to 100 megahertz
D. zero to five Hz

A
B
C
D

#9 In electronics, one Hz (Hertz) means one change per _____ or one cycle per _____ .

A. second, second
B. minute, minute
C. hour, hour
D. day, day

A
B
C
D

#10 What does the 10 Ohm resistor do in the circuit ?

A. increase the current through the speaker
B. vary the frequency of the oscillator
C. reduce current through the speaker
D. lower the frequency of the oscillator

(Form SQ10)

Score	

(Student Name) (Period/Student Number) (Date)

QUIZ for Exp 11 or STEM KIT #11
in the Mr Circuit Electronics Training Lab 1

This Quiz covers the training learned by completing

"How a 555 Timer IC Works" Experiment 11

Circle the letter for your answer to each question and then hand this quiz in to your teacher.

#1 How many pins does a 555 Timer IC have?

A
B
C
D

A. 8
B. 3
C. 6
D. 12

#2 What pin is the output pin on the 555 Timer?

A
B
C
D

A. 8
B. 3
C. 6
D. 12

#3 If you connect an oscilloscope to the output Pin 3 on this circuit when operating, what might you see?

A
B
C
D

A. pulses
B. aliens
C. resistance values
D. inductance variations

#4 What is the value of the capacitor in microfarads connected to Pin 2 of the 555 Timer IC in this circuit?

A
B
C
D

A. 1000uF
B. 10uF
C. 33uF
D. 470uF

#5 If we reverse the polarity of the battery snap on the circuit, what will happen?

A
B
C
D

A. It will work just fine.
B. You might destroy the 555 Timer IC.
C. The LED will burn out.
D. The LED will self-destruct.

#6 What does the indentation or marking on the top end of the 555 Timer IC help you find?

A
B
C
D

A. Pin 5
B. Pin 4
C. Pin 1
D. the bottom of the IC

#7 When a 555 Timer IC is working as a 'clock', it puts out pulses on _____ .

A
B
C
D

A. Pin 8
B. Pin 2
C. Pin 5
D. Pin 3

#8 When you are counting the pins on a 555 Timer IC, you count them _____ .

A
B
C
D

A. up and down
B. clockwise
C. by tens
D. counter-clockwise

#9 When installing the 555 Timer IC on the solderless circuit board, you install it _____ .

A
B
C
D

A. always on the right end of the board
B. with pin 1 in hole 1a
C. across the center channel
D. on the bottom of the board

#10 When a 555 Timer IC is working as a 'timer', it puts out a voltage on _____ for a set period of time and then shuts off automatically.

A
B
C
D

A. Pin 3
B. Pin 5
C. Pin 8
D. Pin 2

(Form SQ11)

Score

(Student Name) (Period/Student Number) (Date)

QUIZ for Exp 12 or STEM KIT #12
in the Mr Circuit Electronics Training Lab 1

This Quiz covers the training learned by completing

"Build a Burglar Alarm Circuit" Experiment 12

Circle the letter for your answer to each question and then hand this quiz in to your teacher.

A B C D

#1 How do you turn off this alarm once it is tripped?

A. touch a negative voltage to the Gate
B. open the normally-open switch
C. remove power from the circuit
D. close the normally-closed switch

A B C D

#2 What item in this alarm circuit indicates that the alarm has been tripped?

A. the LED
B. the Diode
C. the SCR
D. the resistor

A B C D

#3 Which component limits the current flowing through the LED?

A. the SCR
B. the 220 ohm resistor
C. the Diode
D. the 0.1 disc capacitor

A B C D

#4 To trigger the alarm, which lead on the SCR has to receive a small positive voltage?

A. EMITTER
B. CATHODE
C. ANODE
D. GATE

A B C D

#5 Where would you connect a buzzer to this alarm circuit?

A. across R3 and the LED
B. across R1 and S1
C. across R2 and D1
D. across the SCR

A B C D

#6 When the 33 Ohm resistor is connected to the Gate, what happens?

A. the alarm is turned off
B. the alarm is triggered
C. the alarm is reset
D. nothing

A B C D

#7 The cathode of the LED is connected to what pin on the SCR?

A. the Gate
B. the Cathode
C. the Emitter
D. the Anode

A B C D

#8 How many pins are there on an SCR.

A. 1
B. 2
C. 3
D. 4

A B C D

#9 In this circuit, there are how many switches to trigger the alarm circuit?

A. 1
B. 2
C. 3
D. 5

A B C D

#10 How many capacitors do we use in this circuit?

A. 3
B. 2
C. 1
D. 4

(Form SQ12)

Score

(Student Name) (Period/Student Number) (Date)

QUIZ for Exp 13 or STEM KIT #13
in the Mr Circuit Electronics Training Lab 1

This Quiz covers the training learned by completing

"Build an Automatic Night Light Circuit" Experiment 13

Circle the letter for your answer to each question and then hand this quiz in to your teacher.

A B C D

#1 This Automatic Night Light will turn on automatically _____?

A. when there is light.
B. when there is darkness.
C. at noon each day.
D. when it is humid outside.

A B C D

#2 How many LEDs are there in this circuit?

A. 1
B. 3
C. 2
D. 5

A B C D

#3 What is the purpose of the 47 Ohm resistor in the circuit?

A. to increase the current in the circuit
B. to serve as a fuse for the circuit
C. to increase the brightness of the LEDs
D. limit the current through the LEDs

A B C D

#4 What is the purpose of the Potentiometer in the circuit?

A. to make the LEDs blink
B. to adjust the sensitivity of the Photocell
C. to adjust the loudness
D. to make the battery last longer

A B C D

#5 If we reverse the polarity of the battery snap on the circuit, what will happen?

A. it will work just fine.
B. The LEDs will not light up.
C. The LEDs will burn out.
D. The LEDs will self-destruct.

A B C D

#6 The LEDs receive their current from which pin on the NPN transistor?

A. the Collector
B. the Emitter
C. the Base
D. the Gate

A B C D

#7 Resistor R2, 16k Ohms, is connected directly to which terminal on the 9-Volt battery?

A. the negative
B. the center
C. the neutral
D. the positive

A B C D

#8 The potentiometer has 3 connections. How many do we use in this circuit? .

A. 0
B. 2
C. 3
D. 1

A B C D

#9 What are the colors on Resistor R1, 47 Ohms?

A. yellow, violet, black, gold
B. brown, red, black, gold
C. green, green, brown, gold
D. gray, blue, brown, gold

A B C D

#10 This circuit is used to turn on the LEDs _____.

A. when the weather is hot
B. during the day
C. at night
D. when it is a humid day

(Form SQ13)

Score	

(Student Name) (Period/Student Number) (Date)

QUIZ for Exp 14 or STEM KIT #14
in the Mr Circuit Electronics Training Lab 1

This Quiz covers the training learned by completing STEM Kit #14

"Build a DC to DC Power Supply Circuit" Experiment 14

Circle the letter for your answer to each question and then hand this quiz in to your teacher.

#1 This circuit has an input of a fixed DC voltage and an output of _____?

A. a variable DC voltage
B. an AC voltage
C. a voltage higher than the input voltage
D. a voltage from -5V to 5V

#2 What is the maximum current that can be provided by this DC to DC Power Supply?

A. 10 milliamps
B. 3 Amps
C. 50 milliamps
D. 1 Amp

#3 You can use this power supply to supply voltage for _____ .

A. portable transistor radios
B. large HAM radios
C. large Televisions and Stereos
D. microwave ovens

#4 In this circuit, transistor Q1 is used as _____?

A. a capacitor
B. an inductor
C. a fixed capacitance
D. an adjustable resistor

#5 In this circuit, the potentiometer is used to _____ .

A. vary the output voltage
B. adjust the capacitance
C. as a variable inductor
D. keep the LED from burning out

#6 The voltage applied to the base of the transistor controls the _____ of the transistor.

A. external capacitance
B. internal resistance
C. external resistance
D. internal capacitance

#7 The potentiometer controls the voltage applied to the _____ of the transistor.

A. Collector
B. Emitter
C. Anode
D. Base

#8 The output of this DC to DC Power Supply will be a maximum when the _____ of the transistor is close to 0 volts.

A. current applied to the Collector
B. voltage applied to the Base
C. voltage applied to the Emitter
D. current applied to the Base

#9 When the _____ of transistor Q1 is high, the output voltage will be at minimum.

A. external capacitance
B. internal capacitance
C. external resistance
D. internal resistance

#10 In this circuit, the brightness of the LED is an indicator of the _____ .

A. output voltage
B. input voltage
C. input current
D. output capacitance

(Form SQ14)

Score

(Student Name) (Period/Student Number) (Date)

QUIZ for Exp 15 or STEM KIT #15
in the Mr Circuit Electronics Training Lab 1

This Quiz covers the training learned by completing

"Build an Electronic Metronome Circuit" Experiment 15

Circle the letter for your answer to each question and then hand this quiz in to your teacher.

A B C D

#1 This metronome circuit is built using _____ .

A. a 555 Timer IC
B. a two-transistor oscillator
C. an SCR
D. a quad amplifier

A B C D

#2 The potentiometer is used to adjust the _____ .

A. the current through the speaker
B. the capacitance of the transistors
C. the loudness of the speaker
D. speed of the oscillation

A B C D

#3 The Emitter of transistor Q1 is connected to the _____ of transistor Q2.

A. Collector
B. Anode
C. Emitter
D. Base

A B C D

#4 The potentiometer varies the _____ on the Base of transistor Q1.

A. voltage
B. capacitance
C. resistance
D. current

A B C D

#5 As you adjust the potentiometer from 0 Ohms to its maximum Ohms, the oscillator will _____ in speed.

A. decrease
B. increase
C. remain the same
D. not be affected

A B C D

#6 In this circuit, the speaker is connected to the _____ of transistor Q2.

A. Base
B. Anode
C. Collector
D. Emitter

A B C D

#7 Transistor Q1 in this circuit is _____ .

A. a PNP Transistor
B. an NPN Transistor
C. a variable diode
D. a capacitance

A B C D

#8 Based on your understanding of a two-transistor oscillator circuit, the purpose of Capacitor C1 is to _____ .

A. reduce the current in the circuit
B. help control the speed of the oscillator
C. reduce the resistance of the circuit.
D. reduce the voltage used in the circuit

A B C D

#9 The _____ of Q2 is connected directly to the positive of the battery.

A. Emitter
B. Collector
C. Base
D. Anode

A B C D

#10 The positive lead on Capacitor C1 is connected to the _____ of transistor Q1.

A. Collector
B. Anode
C. Emitter
D. Base

A B C D

(Form SQ15)

Score	

(Student Name) (Period/Student Number) (Date)

QUIZ for Exp 16 or STEM KIT #16
in the Mr Circuit Electronics Training Lab 1

This Quiz covers the training learned by completing

"Build an Electronic Motorcycle Circuit" Experiment 16

Circle the letter for your answer to each question and then hand this quiz in to your teacher.

A B C D

#1 This motorcycle circuit is built using _____ .

A. a 555 Timer IC
B. a two-transistor oscillator
C. an SCR
D. a quad amplifier

A B C D

#2 The potentiometer is used to adjust the _____ .

A. the current through the speaker
B. the capacitance of the transistors
C. the loudness of the speaker
D. speed of the oscillation

A B C D

#3 The Emitter of transistor Q1 is connected to the _____ of transistor Q2.

A. Collector
B. Anode
C. Emitter
D. Base

A B C D

#4 The potentiometer varies the _____ on the Base of transistor Q1.

A. voltage
B. capacitance
C. resistance
D. current

A B C D

#5 As you adjust the potentiometer from 0 Ohms to its maximum Ohms, the oscillator will _____ in speed.

A. decrease
B. increase
C. remain the same
D. not be affected

A B C D

#6 In this circuit, the speaker is connected to the _____ of transistor Q2.

A. Base
B. Anode
C. Collector
D. Emitter

A B C D

#7 Transistor Q2 in this circuit is _____ .

A. a PNP Transistor
B. an NPN Transistor
C. a variable diode
D. is a capacitance

A B C D

#8 Based on your understanding of a two-transistor oscillator circuit, the purpose of Capacitor C1 is to _____ .

A. reduce the current in the circuit
B. help control the speed of the oscillator
C. reduce the resistance of the circuit
D. reduce the voltage used in the circuit

A B C D

#9 The _____ of Q2 is connected through a 10 Ohm resistor to the positive of the battery.

A. Emitter
B. Collector
C. Base
D. Anode

A B C D

#10 The positive lead on Capacitor C1 is connected to the _____ of transistor Q1 and to the potentiometer.

A. Collector
B. Anode
C. Emitter
D. Base

(Form SQ16)

Score	

(Student Name) (Period/Student Number) (Date)

QUIZ for Exp 17 or STEM KIT #17
in the Mr Circuit Electronics Training Lab 1

This Quiz covers the training learned by completing

"Build a Railroad Lights Circuit" Experiment 17

Circle the letter for your answer to each question and then hand this quiz in to your teacher.

#1 This circuit uses _____ working as a clock?

A
B
C
D

A. an NPN Transistor
B. a 555 Timer IC
C. a PNP Transistor
D. a Potentiometer

#2 When pin 3 on the 555 Timer is positive, _____ will be forward biased.

A
B
C
D

A. LED 1
B. Resistor R1
C. Resistor R3
D. LED 2

#3 The two LEDs in this circuit are installed in _____ polarity.

A
B
C
D

A. the same
B. amplifying
C. opposite
D. dual

#4 What is the value of the capacitor connected to Pin 2 of the 555 Timer IC in this circuit?

A
B
C
D

A. 1000uF
B. 10uF
C. 33uF
D. 470uF

#5 If we reverse the polarity of the battery snap on the circuit, what will happen?

A
B
C
D

A. it will work just fine
B. you might destroy the 555 Timer IC
C. the LED will burn out
D. the LED will self-destruct

#6 The speed if the blinking LEDs is _____ .

A
B
C
D

A. variable
B. super fast
C. fixed
D. super slow

#7 When this circuit is working, the LEDs will _____ ?

A
B
C
D

A. blink on and off alternately
B. remain off permanently
C. remain on
D. get hot and self-destruct

#8 When an LED is _____ it means that the Anode is positive and the Cathode is negative.

A
B
C
D

A. reverse-biased
B. forward-biased
C. will not turn on
D. will change from Red to Green

#9 When an LED is _____ it means that the Anode is negative and the Cathode is positive.

A
B
C
D

A. reverse-biased
B. forward-biased
C. will not turn on
D. will change from Red to Green

#10 When an LED is forward biased, it will _____ .

A
B
C
D

A. self-destruct
B. turn on
C. get hot
D. turn off

(Form SQ17)

Score	

(Student Name) (Period/Student Number) (Date)

QUIZ for Exp 18 or STEM KIT #18
in the Mr Circuit Electronics Training Lab 1

This Quiz covers the training learned by completing

"Build a Variable Speed Lights Circuit" Experiment 18

Circle the letter for your answer to each question and then hand this quiz in to your teacher.

A B C D

#1 This circuit uses _____ working as a clock?

A. an NPN Transistor
B. a PNP Transistor
C. a 555 Timer IC
D. a Potentiometer

A B C D

#2 You can adjust the speed of the blinking lights by using _____ .

A. the Diode
B. the LED
C. the Potentiometer
D. transistor

A B C D

#3 The two LEDs in this circuit are installed in _____ polarity.

A. the same
B. amplifying
C. dual
D. opposite

A B C D

#4 What is the value of the capacitor connected to Pin 2 of the 555 Timer IC in this circuit?

A. 1000uF
B. 330uF
C. 33uF
D. 10uF

A B C D

#5 If we reverse the polarity of the battery snap on the circuit, what will happen?

A. it will work just fine
B. the LED will burn out
C. you might destroy the 555 Timer IC
D. the LED will self-destruct

A B C D

#6 LED 1 is connect to pin 3 of the 555 Timer IC through _____ .

A. a 220 Ohm resistor
B. a 10uF capacitor
C. a 6.8k Ohm resistor
D. a 1k Ohm resistor

A B C D

#7 When this circuit is working, the LEDs will _____ ?

A. remain on
B. remain off permanently
C. blink on and off alternately
D. get hot and self-destruct

A B C D

#8 When an LED is _____ it means that the Anode is positive and the Cathode is negative.

A. reverse-biased
B. will not turn on
C. forward biased
D. will change from Red to Green

A B C D

#9 When an LED is _____ it means that the Anode is negative and the Cathode is positive.

A. will change from Red to Green
B. forward-biased
C. will not turn on
D. reverse-biased

A B C D

#10 A Potentiometer is also known as _____ .

A. variable transistor
B. fixed capacitor
C. a variable resistor
D. fixed resistor

(Form SQ18)

Score	

(Student Name) (Period/Student Number) (Date)

QUIZ for Exp 19 or STEM KIT #19
in the Mr Circuit Electronics Training Lab 1

This Quiz covers the training learned by completing

"Build a Continuity Tester Circuit" Experiment 19

Circle the letter for your answer to each question and then hand this quiz in to your teacher.

A B C D

#1 This circuit uses 555 Timer IC working as a _____ .

A. an amplifier
B. a timer
C. a clock
D. a light generator

A B C D

#2 The loudness of the tone is _____ .

A. adjustable
B. fixed
C. controlled by Resistor R1
D. controlled by Capacitor C1

A B C D

#3 The speaker in this circuit is connected to the _____ of transistor Q1.

A. Gate
B. Emitter
C. Collector
D. Base

A B C D

#4 What is the value of the capacitor connected to Pin 2 of the 555 Timer IC in this circuit?

A. 0.01uF
B. 330uF
C. 33uF
D. 10uF

A B C D

#5 If we reverse the polarity of the battery snap on the circuit, what will happen?

A. you might destroy the 555 Timer IC
B. the LED will burn out
C. it will work just fine
D. the LED will self-destruct

A B C D

#6 Resistor R3 is connected to _____ of the 555 Timer IC.

A. Pin 3
B. Pin 4
C. Pin 1
D. Pin 6

A B C D

#7 When this circuit is working, the speaker will _____ when there is continuity.

A. remain silent
B. self-destruct
C. emit a tone
D. get hot

A B C D

#8 When you touch the two probes together, the speaker will _____ .

A. remain silent
B. self-destruct
C. get hot
D. emit a tone

A B C D

#9 One probe is connected to R1 and the other one is connected _____ .

A. to the negative of the battery
B. to the speaker
C. to the 0.01uF capacitor
D. to the positive of the battery

A B C D

#10 This circuit emits _____ signal.

A. an inaudible
B. an rf
C. an ultrasonic
D. an audio

(Form SQ19)

Score	

(Student Name) (Period/Student Number) (Date)

QUIZ for Exp 20 or STEM KIT #20
in the Mr Circuit Electronics Training Lab 1

This Quiz covers the training learned by completing

"Build an Audio Generator Circuit" Experiment 20

Circle the letter for your answer to each question and then hand this quiz in to your teacher.

A B C D

#1 This circuit uses 555 Timer IC working as a _____ .

A. a clock
B. a timer
C. an amplifier
D. a light generator

A B C D

#2 The loudness of the tone is _____ .

A. adjustable
B. controlled by Resistor R1
C. fixed
D. controlled by Capacitor C1

A B C D

#3 The speaker in this circuit is connected to the _____ of transistor Q1.

A. Collector
B. Emitter
C. Gate
D. Base

A B C D

#4 What is the value of the capacitor connected to Pin 2 of the 555 Timer IC in this circuit?

A. 10uF
B. 330uF
C. 33uF
D. 0.01uF

A B C D

#5 If we reverse the polarity of the battery snap on the circuit, what will happen?

A. the LED will self-destruct
B. the LED will burn out
C. it will work just fine
D. you might destroy the 555 Timer IC

A B C D

#6 Resistor R2 is connect to _____ of the 555 Timer IC.

A. Pin 3
B. Pin 4
C. Pin 7
D. Pin 6

A B C D

#7 When this circuit is working, the speaker will _____ .

A. remain silent
B. self-destruct
C. emit a variable audiotone
D. get hot

A B C D

#8 To vary the frequency of this oscillator, you adjust _____ .

A. the potentiometer
B. the transistor
C. 555 Timer IC
D. battery snap

A B C D

#9 Pins 4 and 8 on the 555 Timer IC are _____ .

A. connected together
B. are insulated from each other
C. do not need to be connected
D. are not important in this circuit

A B C D

#10 The word 'tone' is the same thing as _____ .

A. loudness
B. pitch
C. excitation
D. bias

(Form SQ20)

Score	

(Student Name) (Period/Student Number) (Date)

QUIZ for Exp 21 or STEM KIT #21
in the Mr Circuit Electronics Training Lab 1

This Quiz covers the training learned by completing

"Build an Electronic Police Siren Circuit" Experiment 21

Circle the letter for your answer to each question and then hand this quiz in to your teacher.

A B C D

#1 This circuit uses 555 Timer IC working as a _____ .

A. a light generator
B. a timer
C. an amplifier
D. clock

A B C D

#2 The loudness of the tone is _____ .

A. adjustable
B. controlled by Resistor R1
C. controlled by Capacitor C1
D. fixed

A B C D

#3 The speaker in this circuit is connected to the _____ of transistor Q1.

A. Base
B. Emitter
C. Gate
D. Collector

A B C D

#4 What is the value of the capacitor connected to Pin 6 of the 555 Timer IC in this circuit?

A. 10uF
B. 330uF
C. 33uF
D. 0.01uF

A B C D

#5 If we reverse the polarity of the battery snap on the circuit, what will happen?

A. the LED will self-destruct
B. the LED will burn out
C. you might destroy the 555 Timer IC
D. it will work just fine

A B C D

#6 Resistors R5 and R6 are _____ .

A. not connected
B. connected
C. not important
D. are connected to pin 7

A B C D

#7 When this circuit is working, the speaker will _____ .

A. remain silent
B. self-destruct
C. emit a variable audiotone
D. get hot

A B C D

#8 To vary the frequency of this oscillator, you _____ .

A. adjust the potentiometer
B. use the pushbutton switch
C. use the battery snap
D. remove resistor R1

A B C D

#9 The rising and falling of the frequency of the oscillator is controlled by _____ .

A. the distance C2 is from the battery
B. charging and discharging of C2
C. charging and discharging of C1
D. the size of the speaker

A B C D

#10 Switch S1 is in series with _____ .

A. C1 and C2
B. R1 and R2
C. R5 and R6
D. R3 and R4

(Form SQ21)

Score	

(Student Name) (Period/Student Number) (Date)

QUIZ for Exp 22 or STEM KIT #22
in the Mr Circuit Electronics Training Lab 1

This Quiz covers the training learned by completing

"Build a Wake-Up Alarm Circuit" Experiment 22

Circle the letter for your answer to each question and then hand this quiz in to your teacher.

#1 This circuit uses a _____ to sense light intensity?

A
B
C
D

A. an SCR
B. a 555 Timer IC
C. a transistor
D. a Photocell

#2 What pin on the 555 Timer is connected to a 220 Ohm resistor?

A
B
C
D

A. 8
B. 3
C. 6
D. 12

#3 With this circuit, you can generate a variety of interesting _____ by shadowing the surface of the Photocell with your hand.

A
B
C
D

A. weather conditions
B. electronic displays
C. light displays
D. sound effects

#4 What is the value of the capacitor connected to Pin 2 and Pin 6 of the 555 Timer IC in this circuit?

A
B
C
D

A. 0.01uF
B. 10uF
C. 0.1uF
D. 470uF

#5 How many pins on the 555 Timer IC do we use in this circuit?

A
B
C
D

A. 7
B. 3
C. 8
D. 1

#6 Pins 4 and 8 of the 555 Timer IC are _____ .

A
B
C
D

A. connected
B. are not connected
C. are isolated from each other
D. are not important

#7 When the Photocell receives a lot of light, the alarm will _____.

A
B
C
D

A. go silent
B. make noise
C. burn up
D. give off moisture

#8 To increase the amplitude of the pulses coming from the output Pin 3 of the 555 Timer IC we use _____ .

A
B
C
D

A. an SCR
B. a PNP transistor
C. an NPN Transistor
D. variable capacitor

#9 The Photocell is connected to Pins 7, 6, and _____ .

A
B
C
D

A. 8
B. 4
C. 1
D. 2

#10 Pin 1 of the 555 Timer IC is connected to the negative of the battery, to Pin 1 and _____ .

A
B
C
D

A. the Emitter of the NPN Transistor
B. the Collector of the PNP Transistor
C. the 100 Ohm resistor
D. the speaker

(Form SQ22)

Score	

(Student Name) (Period/Student Number) (Date)

QUIZ for Exp 23 or STEM KIT #23
in the Mr Circuit Electronics Training Lab 1

This Quiz covers the training learned by completing

"Build a Variable Timer Circuit" Experiment 23

Circle the letter for your answer to each question and then hand this quiz in to your teacher.

A B C D

#1 This circuit uses a 555 Timer IC as a _____ .

A. a clock
B. variable capacitor
C. a timer
D. variable resistor

A B C D

#2 What pin on the 555 Timer is connected to an LED?

A. 8
B. 3
C. 6
D. 12

A B C D

#3 All the pins on the 555 Timer IC are used in this circuit except _____ .

A. Pin 5
B. Pin 1
C. Pin 8
D. Pin 4

A B C D

#4 The Switch S1 is connected to Pin 2 and to _____ .

A. Pin 4
B. Pin 6
C. Pin 1
D. Pin 3

A B C D

#5 What is the purpose of the Potentiometer in this circuit?

A. to vary how long the LED is ON
B. to vary the volume of the sound
C. to count the pulses
D. to vary the brightness of the LED

A B C D

#6 If you want the LED to stay on longer, what would you do?

A. replace C1 with 1000uF
B. remove C1 from the circuit
C. reduce the capacitance of C1
D. short C1

A B C D

#7 The positive of C1 is connected to _____ .

A. Pin 4
B. Pin 2
C. Pin 6
D. Pin 8

A B C D

#8 To 'trigger' the timer to start, you _____ .

A. apply a positive voltage to Pin 1
B. remove the voltage from Pin 3
C. increase the voltage on Pin 8
D. apply a negative voltage to Pin 2

A B C D

#9 The Potentiometer is connected to _____ .

A. Pins 7 and 8
B. Pins 6 and 7
C. Pins 4 and 5
D. Pins 3 and 4

A B C D

#10 The amount of time the LED remains on after the timer is 'triggered' depends on the values of R2, R4, and _____ .

A. R3
B. C1
C. R1
D. the LED

(Form SQ23)

Score	

(Student Name) (Period/Student Number) (Date)

QUIZ for Exp 24 or STEM KIT #24
in the Mr Circuit Electronics Training Lab 1

This Quiz covers the training learned by completing

"Build a Moisture Detector Circuit" Experiment 24

Circle the letter for your answer to each question and then hand this quiz in to your teacher.

#1 This circuit uses a 555 Timer IC as a _____ .

A **A.** a clock
B **B.** variable capacitor
C **C.** a timer
D **D.** variable resistor

#2 What is connected to pin 3 on the 555 Timer IC?

A **A.** an LED
B **B.** a 220 Ohm resistor
C **C.** a 10uF capacitor
D **D.** a Photocell

#3 On the 555 Timer _____ .

A **A.** only 6 pins are used
B **B.** all but pin 5 are used
C **C.** all 8 pins are used
D **D.** all but pin 4 are used

#4 The purpose of this circuit is to _____ in soil.

A **A.** sense moisture
B **B.** sense vibrations
C **C.** sense heat
D **D.** sense light

#5 What controls the frequency of the output tone?

A **A.** humidity in the air
B **B.** the air temperature
C **C.** resistance between the probes
D **D.** the brightness of the sun

#6 The more moisture in the soil, the _____ .

A **A.** the slower the blinks of the LED
B **B.** the hotter the LED gets
C **C.** the faster the blinks of the LED
D **D.** the higher the input voltage

#7 Pin 1 of the 555 Timer IC is connected is connected to _____ .

A **A.** the negative of the battery.
B **B.** Pin 5
C **C.** the positive of the battery
D **D.** the positive of C1

#8 To make sure the circuit is working, you _____ .

A **A.** touch the probes together
B **B.** short capacitor C1
C **C.** remove the LED
D **D.** disconnect the battery

#9 Pins 6 and 2 are _____ .

A **A.** not connected
B **B.** connected
C **C.** not important
D **D.** determine the brightness of the LED.

#10 If the soil is dry, the LED will _____ .

A **A.** blink
B **B.** remain either ON or OFF
C **C.** get hot
D **D.** the LED will self-destruct

(Form SQ24)

Score

(Student Name) (Period/Student Number) (Date)

QUIZ for Exp 25 or STEM KIT #25
in the Mr Circuit Electronics Training Lab 1

This Quiz covers the training learned by completing

"Build a Code Oscillator Circuit" Experiment 25

Circle the letter for your answer to each question and then hand this quiz in to your teacher.

#1 This circuit uses a 555 Timer IC as _____ .

A
B
C
D

A. a variable resistor
B. a variable capacitor
C. a timer
D. a clock

#2 R3 is connected to pin 3 on the 555 Timer IC and to the _____ on Q1.

A
B
C
D

A. Emitter
B. Base
C. Collector
D. Anode

#3 On the 555 Timer _____ .

A
B
C
D

A. only 6 pins are used
B. all but pin 5 are used
C. all 8 pins are used
D. all but pin 4 are used

#4 The purpose of this circuit is to _____ as you press the pushbutton switch.

A
B
C
D

A. sense moisture
B. sense vibrations
C. emit an audio tone
D. sense light

#5 How do you send Morse Code with this oscillator circuit?

A
B
C
D

A. you press the pushbutton switch
B. you squeeze resistor R1
C. you remove the 10 Ohm resistor
D. you adjust the speaker

#6 The loudness of the emitted tone _____ .

A
B
C
D

A. is fixed
B. is adjustable by the value of R1
C. is adjustable by the value of C1
D. is controlled by S1

#7 If you do not press the pushbutton switch, the circuit _____ .

A
B
C
D

A. will consume power
B. will cause the speaker to emit a tone
C. will apply voltage to the 555 Timer IC
D. will not consume power

#8 To make sure the circuit is working, you _____ .

A
B
C
D

A. press the pushbutton switch to make a tone
B. short capacitor C1
C. remove the LED
D. disconnect the battery

#9 Pins 4 and 8 are _____ .

A
B
C
D

A. not connected
B. connected
C. not important
D. determine the brightness of the LED.

#10 What controls the speed at which you send code with this oscillator?

A
B
C
D

A. the battery
B. the speaker
C. you do.
D. the transistor

(Form SQ25)

Score	

(Student Name) (Period/Student Number) (Date)

QUIZ for Exp 26 or STEM KIT #26
in the Mr Circuit Electronics Training Lab 1

This Quiz covers the training learned by completing

"Build an Audible Water Detector Circuit" Experiment 26

Circle the letter for your answer to each question and then hand this quiz in to your teacher.

A B C D

#1 This circuit uses a 555 Timer IC as _____ .

A. a variable resistor
B. a variable capacitor
C. a clock
D. a timer

A B C D

#2 R4 is connected to _____ and to the positive of the battery.

A. the speaker
B. the transistor
C. the 555 Timer IC
D. the capacitor C1

A B C D

#3 On the 555 Timer _____ .

A. only 6 pins are used
B. all but pin 4 are used
C. all 8 pins are used
D. all but pin 5 are used

A B C D

#4 The purpose of this circuit is to _____ .

A. sense the presence of water
B. sense vibrations
C. sense heat
D. sense light

A B C D

#5 What happens when this circuit is triggered?

A. you hear a tone in the speaker
B. you hear a loud cracking sound
C. an LED starts blinking
D. the capacitor gets hot

A B C D

#6 The loudness of the emitted tone _____ .

A. is fixed
B. is adjustable by the value of R1
C. is adjustable by the value of C1
D. is controlled by S1

A B C D

#7 Resistors R1 and R2 _____ .

A. are connected
B. are not connected
C. are not important in the circuit
D. control the loudness of the speaker

A B C D

#8 To make sure the circuit is working, you _____ .

A. remove resistor R4
B. short capacitor C1
C. put the probes into water
D. disconnect the battery

A B C D

#9 Pins 1 and 3 of the 555 Timer IC are _____ .

A. not connected
B. connected
C. not important
D. determine the loudness of the speaker

A B C D

#10 Capacitor C1 is connected to Pin 1 and to _____ .

A. Pin 8
B. Pin 7
C. Pin 4
D. the Emitter of transistor Q1

(Form SQ26)

Score	

(Student Name) (Period/Student Number) (Date)

QUIZ for Exp 27 or STEM KIT #27
in the Mr Circuit Electronics Training Lab 1

This Quiz covers the training learned by completing

"Build an English Police Siren Circuit" Experiment 27

Circle the letter for your answer to each question and then hand this quiz in to your teacher.

A B C D

#1 This circuit uses a 555 Timer IC as _____ .

A. a clock
B. a variable capacitor
C. a variable resistor
D. a timer

A B C D

#2 R5 is connected to R1, R2 , Switch S1 and to _____.

A. Pin 7
B. the transistor
C. the speaker
D. capacitor C1

A B C D

#3 On the 555 Timer _____ .

A. all but pin 5 are used
B. all but pin 4 are useds
C. all 8 pins are used
D. only 6 pins are used

A B C D

#4 The purpose of this circuit is to _____ .

A. emit a siren sound
B. emit bird chirps
C. sense heat
D. sense light

A B C D

#5 How do you make the circuit emit two tones?

A. connect and disconnect the battery
B. remove and replace the 10 Ohm resistor
C. press and release the pushbutton switch
D. squeeze capacitor C1

A B C D

#6 The loudness of the emitted tone _____ .

A. is controlled by S1
B. is adjustable by the value of R1
C. is adjustable by the value of C1
D. is fixed

A B C D

#7 Resistors R1, R2 and R5 _____ .

A. are not connected
B. control the loudness of the speaker
C. are not important in the circuit
D. are connected

A B C D

#8 When this circuit is working correctly, as soon as you _____ it will emit a tone.

A. press the switch S1
B. connect the battery
C. remove the 555 Timer IC
D. install capacitor C1

A B C D

#9 Pressing Switch S1 puts _____ in parallel.

A. R1 and R2
B. R2 and R3
C. R5 and R2
D. R4 and R5

A B C D

#10 In order to shut off this circuit, you must _____.

A. disconnect the battery
B. hold down the pushbutton switch
C. hold your ears
D. change capacitor C1 to a different value

(Form SQ27)

Score	

(Student Name) (Period/Student Number) (Date)

QUIZ for Exp 28 or STEM KIT #28
in the Mr Circuit Electronics Training Lab 1

This Quiz covers the training learned by completing

"Build an Electronic Canary Circuit" Experiment 28

Circle the letter for your answer to each question and then hand this quiz in to your teacher.

A B C D

#1 This circuit uses a 555 Timer IC and _____ .

A. an SCR
B. a variable capacitor
C. a two-transistor oscillator
D. a Photocell

A B C D

#2 R1 is connected to _____ .

A. R3
B. R7
C. C1
D. R2

A B C D

#3 On the 555 Timer _____ .

A. all but pin 5 are used
B. all but pin 4 are useds
C. all 8 pins are used
D. only 6 pins are used

A B C D

#4 The purpose of this circuit is to _____ .

A. emit a siren sound
B. emit bird chirps
C. sense heat
D. sense light

A B C D

#5 How do you make the circuit emit different tones?

A. connect and disconnect the battery
B. adjust R7 and press the pushbutton
C. vary the heat in the room
D. feed it birdseed

A B C D

#6 The output of the two-transistor oscillator is fed into _____ of the 555 Timer IC .

A. Pin 5
B. Pin 6
C. Pin 7
D. Pin 8

A B C D

#7 Switch S1 is connected to _____ .

A. Pin 4
B. Pin 1
C. Pin 3
D. Pin 6

A B C D

#8 One side of the speaker is connected directly to _____ .

A. the Base of Q1
B. the Emitter of Q2
C. Pin 2 on the 555 Timer IC
D. the positive of the battery

A B C D

#9 C4 and R6 are connected in parallel to the speaker and _____ of the 555 Timer IC.

A. Pin 3
B. Pin 4
C. Pin 5
D. Pin 8

A B C D

#10 Capacitor C1 is part of _____ .

A. the two-transistor oscillator circuit
B. the voltage regulator circuit
C. the power supply circuit
D. output circuit

(Form SQ28)

Score	

(Student Name) (Period/Student Number) (Date)

QUIZ for Exp 29 or STEM KIT #29
in the Mr Circuit Electronics Training Lab 1

This Quiz covers the training learned by completing

"Build a fantasy Space Machine Gun Circuit" Experiment 29

Circle the letter for your answer to each question and then hand this quiz in to your teacher.

#1 This circuit uses a 555 Timer IC and _____ .

A **A.** an SCR
B **B.** a variable capacitor
C **C.** a Photocell
D **D.** a two-transistor oscillator

#2 R4 is connected to _____ .

A **A.** Pin 7
B **B.** R7
C **C.** C1
D **D.** R2

#3 On the 555 Timer _____ .

A **A.** all 8 pins are used
B **B.** all but pin 4 are useds
C **C.** all but pin 5 are used
D **D.** only 6 pins are used

#4 The purpose of this circuit is to _____ .

A **A.** emit a siren sound
B **B.** emit bird chirps
C **C.** emit phasor machine gun sounds
D **D.** emit crunching sounds

#5 In addition to fantasy machine gun sounds what else does the circuit do?

A **A.** vibrates like a snake
B **B.** chirps like a bird
C **C.** varies the heat in the room
D **D.** emits a light effect with an LED

#6 The Collector of transistor Q2 is connected to _____ of the 555 Timer IC.

A **A.** Pin 5
B **B.** Pin 6
C **C.** Pin 7
D **D.** Pin 8

#7 Switch S1 is connected to _____ .

A **A.** the positive of the battery
B **B.** resistor R6
C **C.** the Base of transistor Q2
D **D.** the negative of the battery

#8 One side of the speaker is connected directly to _____ .

A **A.** an LED
B **B.** Pin 3 on the 555 Timer IC
C **C.** Pin 7 on the 555 Timer IC
D **D.** the positive of the battery

#9 The Anode of the LED is connected directly to _____ .

A **A.** Pin 3
B **B.** the positive of the battery
C **C.** the negative of the battery
D **D.** Pin 7

#10 Resistor R5 is connected across _____ .

A **A.** pins 6 and 7 of the 555 Timer IC
B **B.** the speaker
C **C.** the power supply circuit
D **D.** output circuit

(Form SQ29)

Score

(Student Name) (Period/Student Number) (Date)

QUIZ for Exp 30 or STEM KIT #30
in the Mr Circuit Electronics Training Lab 1

This Quiz covers the training learned by completing

“Build an Ultrasonic Pest Repeller Circuit” Experiment 30

Circle the letter for your answer to each question and then hand this quiz in to your teacher.

A B C D

#1 This circuit uses a 555 Timer IC and _____ .

A. a two-transistor oscillator
B. a variable capacitor
C. a Photocell
D. an SCR

A B C D

#2 R6 is connected to _____ .

A. Pin 7
B. R7
C. C1
D. Pin 3

A B C D

#3 On the 555 Timer _____ .

A. all but pin 4 are used
B. all 8 pins are used
C. all but pin 5 are used
D. only 6 pins are used

A B C D

#4 The purpose of this circuit is to _____ .

A. emit a siren sound
B. emit ultrasonic sounds
C. emit phasor machine gun sounds
D. emit crunching sounds

A B C D

#5 What are the signals from this circuit supposed to do?

A. repel pests
B. chirp like a birds
C. varies the heat in the room
D. vibrate like a snake

A B C D

#6 The frequencies that may repel pests are from 13.5 thousand cycles per second to _____ .

A. 1 Megacycle (1Mhz)
B. 80 thousand cycles per second (80kHz)
C. 25 Giga Hz
D. 10 milli Hz

A B C D

#7 How can you tell if the circuit is working?

A. you can feel the speaker vibrate
B. resistor R6 will be smoking
C. the LED will light up
D. the battery will be hot

A B C D

#8 One side of the speaker is connected directly to _____ .

A. the positive of the battery
B. Pin 3 on the 555 Timer IC
C. Pin 7 on the 555 Timer IC
D. an LED

A B C D

#9 C1 is 10uF and it is part of the _____ .

A. two-transistor oscillator
B. power supply circuit
C. output circuit
D. heat sensing circuit

A B C D

#10 What capacitor is connected to R3 and R4?

A. C1
B. C2
C. C3
D. Q2

A B C D

(Form SQ30)

Score	

QUICK-CHECK ANSWER KEY for Lesson 1 QUIZ
for Mr Circuit Electronics Training ("Electron "Theory")

Place this sheet over top of the STUDENT QUIZ (offset a little to the left and then offset to the right) to compare the answers on this sheet to the answers that the student marked. Put an 'X' for each wrong answer.

Count the right answers and record the score of right answers in your grade book.

A
(B)
C
D

#1 Everything around you is made of _____ .

A. wood
B. matter
C. steel
D. water

A
B
(C)
D

#2 Matter is made up of _____ .

A. water
B. steel
C. elements
D. wood

(A)
B
C
D

#3 Atoms are what make up _____ .

A. elements
B. protons
C. electrons
D. neutrons

A
B
(C)
D

#4 In the nucleus of _____ are protons and neutrons.

A. an electron
B. a proton
C. an atom
D. a neutron

(A)
B
C
D

#5 The movement of electrons from atom to atom is called _____ .

A. an electron current
B. an electron charge
C. an electron resistance
D. a neutron flow

A
(B)
C
D

#6 Atoms have a central core called _____ .

A. a middle section
B. a nucleus
C. a slice
D. a modecum

(A)
B
C
D

#7 What are the positively charged particles in an atom called?

A. protons
B. products
C. add ons
D. neutrons

A
B
C
(D)

#8 A particle in an atom that has no electrical charge is called _____ .

A. a nothing
B. a widget
C. a neutron
D. an axion

A
B
(C)
D

#9 The part of Physics that studies the movement of electrons is called _____ .

A. resistance
B. conductance
C. capacitance
D. electronics

(A)
B
C
D

#10 What circulates through the filament of an incandescent bulb to make it light up?

A. electrons
B. magnets
C. protons
D. neutrons

(Form SQAK00-1)

QUICK-CHECK ANSWER KEY for Lesson 2 QUIZ

for Mr Circuit Electronics Training ("Component Identification")

Place this sheet over top of the STUDENT QUIZ (offset a little to the left and then offset to the right) to compare the answers on this sheet to the answers that the student marked. Put an 'X' for each wrong answer.

Count the right answers and record the score of right answers in your grade book.

A
B
C
D

#1 What is the primary function of a battery in a circuit?

A. store electric energy
B. serve as a paper weight
C. give resistance to a circuit
D. amplify electricity

A
B
C
D

#2 What is the primary function of a resistor?

A. resist proton flow
B. add color to your circuit
C. count electrons
D. limit or control current

A
B
C
D

#3 What is the primary function of an LED?

A. control electron flow
B. light up when current flows through it
C. provide heat to keep you warm
D. store electrons

A
B
C
D

#4 Which set of components has a schematic symbol that includes a 'squiggly' line?

A. a resistor, a photocell, and a potentiometer
B. a capacitor and an SCR
C. an LED and a Battery
D. an Integrated Circuit and a Speaker

A
B
C
D

#5 Which of these has a 'diode symbol' as part of its symbol?

A. a Diode
B. an SCR
C. an LED
D. All the above

A
B
C
D

#6 Which type of capacitor generally stores relatively large amount of electric charge?

A. a ceramic disc capacitor
B. an electrolytic capacitor
C. a surface mount capacitor
D. a mica capacitor

A
B
C
D

#7 What component varies its resistance according to the light intensity?

A. a Photocell
B. a Transistor
C. a 555 Timer IC
D. an SCR

A
B
C
D

#8 What component has an Emitter, Base, and Collector?

A. a Transistor
B. an SCR
C. a Diode
D. a Potentiometer

A
B
C
D

#9 Which of these component has a Gate, an Anode, and a Cathode lead?

A. an SCR
B. a Transistor
C. a Diode
D. a Resistor

A
B
C
D

#10 What is the purpose of a speaker?

A. convert electrical currents into sound waves
B. use power
C. be an adjustable capacitor
D. take up space in a circuit

(Form SQAK00-2)

QUICK-CHECK ANSWER KEY for Lesson 3 QUIZ

for Mr Circuit Electronics Training ("Resistor Color Code")

Place this sheet over top of the STUDENT QUIZ (offset a little to the left and then offset to the right) to compare the answers on this sheet to the answers that the student marked. Put an 'X' for each wrong answer.

Count the right answers and record the score of right answers in your grade book.

A
(B)
C
D

#1 A resistor of 10,000 Ohms has _____ than a resistor of 1,000 Ohms.

A. less opposition to current flow
B. more opposition to current flow
C. less Ohms
D. larger physical size

A
B
(C)
D

#2 Resistance in electronics is the _____ .

A. encouragement to current flow
B. not important
C. opposition to current flow
D. storage of electrons

(A)
B
C
D

#3 The fourth color band on a ±5% resistor is what color?

A. gold
B. silver
C. black
D. red

(A)
B
C
D

#4 Why do we put color bands on resistors?

A. because numbers would be very small
B. because colors make the circuit work better
C. electronics likes many colors
D. to test for colorblindness

A
(B)
C
D

#5 What is the purpose for the Resistor Color Code?

A. to hide the value of the resistor
B. to determine the Ohms of the resistor
C. to add color to the circuit
D. to make it hard to read the value in Ohms

#6 What does the color green stand for in the Resistor Color Code?

A. 5
B. 9
C. 0
D. 3

(A)
B
C
D

#7 What is the value in Ohms of a resistor with color bands of yellow, violet, black, gold?

A. 55,000 Ohms
B. 360 Ohms
C. 47 Ohms
D. 68k Ohms

A
B
(C)
D

#8 If the fourth or last band on a resistor is the color silver, what is the tolerance?

A. ±10%
B. ±5%
C. ±3%
D. ±2%

(A)
B
C
D

#9 There are four bands on a ±5% resistor. The first two colors represent _____ .

A. alpha numerics
B. alpha characters
C. negative numbers
D. numerals

A
B
C
(D)

#10 In the Resistor Color Code, what is the color that represents '2'?

A. Orange
B. Violet
C. Red
D. Black

A
B
(C)
D

(Form SQAK00-3)

QUICK-CHECK ANSWER KEY for Lesson 4 QUIZ

for Mr Circuit Electronics Training ("Solderless Circuit Board")

Place this sheet over top of the STUDENT QUIZ (offset a little to the left and then offset to the right) to compare the answers on this sheet to the answers that the student marked. Put an 'X' for each wrong answer.

Count the right answers and record the score of right answers in your grade book.

A B C (D)

#1 Why do we use a Solderless Circuit Board to assemble circuits?

A. to make the circuit more permanent
B. to add more resistance to the circuit
C. to slow down the electrons
D. to make connections without soldering

(A) B C D

#2 What is the purpose of the channel down the middle of the solderless circuit board?

A. to be able to install Integrated Circuits
B. to release moisture from the circuit
C. to separate resistors from capacitors
D. to count the components in the circuit

A B (C) D

#3 Each hole in a 'vertical group' or set of 5 holes is _____ .

A. not connected electrically
B. full of high resistance
C. electrically connected
D. has a high voltage

A (B) C D

#4 A Solderless Circuit Board is _____ .

A. not reusable
B. reusable
C. never used by technicians and engineers
D. difficult to find

A B C (D)

#5 How many sets of 5 holes are there on the Solderless Circuit Board provided?

A. 22
B. 660
C. 500
D. 60

(A) B C D

#6 Each hole in the Solderless Circuit Board is designed to accept how many wires or leads?

A. 1
B. 5
C. 3
D. 14

A B C D

#7 On the Solderless Circuit Board, an Integrated Circuit is installed _____ . .

A. anywhere you like
B. on one side of the other
C. hanging off the edge of the board
D. straddling the center channel

A B C (D)

#8 Inside the holes in the Solderless Circuit Board are clips made of _____ .

A. plastic
B. wood
C. metal
D. pvc material

A B (C) D

#9 Why are there numbers and letters on the Solderless Circuit Board?

A. for decoration
B. to practice counting
C. to identify each and every hole
D. for no real purpose

A B (C) D

#10 The 5 holes in a vertical group on a Solderless Circuit Board are all _____ .

A. shorted together
B. not shorted together
C. are insulated from each other
D. are glued together

(A) B C D

(Form SQAK00-4)

QUICK-CHECK ANSWER KEY for Experiment 01 QUIZ
for Mr Circuit Electronics Training ("Resistor")

Place this sheet over top of the STUDENT QUIZ (offset a little to the left and then offset to the right) to compare the answers on this sheet to the answers that the student marked. Put an 'X' for each wrong answer.

Count the right answers and record the score of right answers in your grade book.

A (B) C D

#1 In Experiment #1, the brightness of the LED depends on _____ .

A. the capacitor value in the circuit
B. the value of the resistor in the circuit
C. the solderless circuit board
D. the battery snap

(A) B C D

#2 Of the four values of resistors in Exp. #1, which value caused the LED to be the brightest?
A. 100 ohm
B. 220 ohm
C. 1k ohm
D. 6.8k ohm

A B C (D)

#3 What color is the third band on the 6.8k ohm resistor?

A. blue
B. green
C. black
D. red

A (B) C D

#4 Which side of battery does the electron current flow from?

A. positive side
B. left side
C. negative side
D. top side

A B (C) D

#5 What is the color of the positive lead on the battery snap?

A. green
B. red
C. black
D. yellow

A B C (D)

#6 The short lead on an LED is?

A. the Gate
B. the Anode
C. the Cathode
D. the Positive

A B (C) D

#7 What are the colors on a 1000 Ohm ±5% resistor?

A. brown, black, red, gold
B. green, blue, red, silver
C. blue, gray, red, gold
D. brown, red, green silver

(A) B C D

#8 With an LED in a circuit, the more _____, the greater the brightness.
A. air
B. capacitance
C. current
D. light

A B (C) D

#9 To reduce the amount of current flowing in a circuit, you can _____ the amount of resistance.
A. increase
B. decrease
C. rotate
D. circle

(A) B C D

#10 Of the four values of resistors in Exp. #1, which value caused the LED to be the dimmest?
A. 100 ohm
B. 220 ohm
C. 1k ohm
D. 6.8k ohm

A B C (D)

(Form SQAK01)

QUICK-CHECK ANSWER KEY for Experiment 02 QUIZ
for Mr Circuit Electronics Training ("Potentiometer")

Place this sheet over top of the STUDENT QUIZ (offset a little to the left and then offset to the right) to compare the answers on this sheet to the answers that the student marked. Put an 'X' for each wrong answer.

Count the right answers and record the score of right answers in your grade book.

A
B
C
D

#1 Between which leads on the Potentiometer in Experiment #02 does the resistance measure the maximum?
A. leads A and B
B. leads A and C
C. leads C and B
D. there is no maximum resistance

A
B
C
D

#2 The 'cursor' on the Potentiometer is connected to which lead?

A. C
B. A
C. it is not connected to any lead
D. B

A
B
C
D

#3 The resistance value of the Potentiometer is zero when the 'cursor' is moved next to which lead?
A. B
B. A
C. black
D. C

A
B
C
D

#4 Does the polarity of the battery connection matter in this circuit?

A. NO
B. it is not important
C. YES
D. the LED will light up either way

A
B
C
D

#5 In Exp. #2, what is the name of the electronic component that you are learning about?
A. the Potentiometer
B. an LED
C. a capacitor
D. a battery snap

A
B
C
D

#6 What is the function of the Potentiometer in Exp. #2?

A. to vary the capacitance in the circuit
B. to reduce proton flow
C. to slow down the speed of the electrons
D. to vary the resistance in the circuit

A
B
C
D

#7 In Exp. #2, what is the purpose of the 100 ohm resistor in the circuit?

A. to protect the LED from burning out
B. to increase the amount of current flowing
C. to make the circuit more interesting
D. to increase the parts used in the circuit

A
B
C
D

#8 When you twist the shaft on a Potentiometer, it varies its _____ .

A. resistance
B. capacitance
C. area
D. wattage

A
B
C
D

#9 To set the Potentiometer at its maximum resistance you have to move the 'cursor' next to which lead?
A. B
B. A
C. black
D. C

A
B
C
D

#10 The LED is the brightest when the 'cursor' on the Potentiometer is next to which lead?

A. B
B. A
C. black
D. C

(Form SQAK02)

QUICK-CHECK ANSWER KEY for Experiment 03 QUIZ
for Mr Circuit Electronics Training ("Photocell")

Place this sheet over top of the STUDENT QUIZ (offset a little to the left and then offset to the right) to compare the answers on this sheet to the answers that the student marked. Put an 'X' for each wrong answer.

Count the right answers and record the score of right answers in your grade book.

A
(B)
C
D

#1 How many leads does a Photocell have?

A. 1
B. 2
C. 3
D. 6

A
(B)
C
D

#2 Does a Photocell have polarity?

A. YES
B. NO
C. maybe
D. not necessarily

(A)
B
C
D

#3 In order for a Photocell to vary its resistance, light has to hit the _____.

A. top surface
B. bottom surface
C. the leads
D. the left side

A
B
C
(D)

#4 If you reverse the leads on the battery snap, how will that affect the circuit?

A. the LED will be brighter
B. the circuit will work just fine
C. the LED will get hot and burn up
D. the LED will not light up

A
B
(C)
D

#5 If you put this circuit into a dark room, how will that affect the LED brightness?

A. it will be super bright
B. it will burn out
C. it will be dimmer
D. it will be the same as in bright light

#6 This circuit has three components. They are the battery snap, a resistor, and a _____ .

A. Photocell
B. Potentiometer
C. capacitor
D. microphone

(A)
B
C
D

#7 In this experiment, what do we use to shield the light from hitting the Photocell?

A. a flashlight
B. a fork
C. a hand
D. a forklift

A
B
(C)
D

#8 A Photocell changes its resistance because it is sensitive to _____.

A. air
B. pressure
C. gravity
D. light

A
B
C
(D)

#9 When you block the amount of light hitting a Photocell, its resistance _____ .

A. is not affected
B. decreases
C. causes more capacitance in the circuit
D. increases

A
B
C
(D)

#10 How does the brightness of the light that hits the Photocell affect the LED in the circuit?

A. has no effect at all
B. brighter the light, brighter the LED
C. LEDs don't get brighter or dimmer
D. dimmer the light, brighter the LED

A
(B)
C
D

(Form SQAK03)

QUICK-CHECK ANSWER KEY for Experiment 04 QUIZ
for Mr Circuit Electronics Training ("Capacitor")

Place this sheet over top of the STUDENT QUIZ (offset a little to the left and then offset to the right) to compare the answers on this sheet to the answers that the student marked. Put an 'X' for each wrong answer.

Count the right answers and record the score of right answers in your grade book.

A (B) C D

#1 In Experiment #4, what is the component that you learned about?

A. a capacitor
B. a resistor
C. an LED
D. a battery snap

A B (C) D

#6 What happens to the LED if we reverse the polarity on the battery?

A. it lights up just fine
B. it burns out the LED
C. the LED will not light up
D. the LED will get hot

A (B) C D

#2 In Exp. #4, how many resistors do we use?

A. 1
B. 2
C. 3
D. 4

A B C (D)

#7 The more capacitance a capacitor has, the _____ electrical charge it will hold.

A. less
B. fuzzier
C. worse
D. more

A (B) C D

#3 In Exp. #4, when you disconnect the battery, the LED remains lit for a time because _____.

A. the two resistors keep it lit
B. the energy stored in the capacitor keeps it lit
C. LEDs store electrons
D. your eyes are playing tricks on you.

(A) B C D

#8 Which value of capacitor will hold more electrical charge?

A. 1000uF
B. 100uF
C. 10uF
D. 1uF

A B (C) D

#4 What happens to the LED when we reduce the value of the capacitor in the circuit and then disconnect the battery?

A. The LED remains lit for a longer time.
B. The LED will burn out.
C. The LED remains lit for shorter time.
D. It will have no effect on the LED.

A B C (D)

#9 What is the purpose of a capacitor in a circuit?

A. to vary the resistance
B. to store inductance
C. to store an electrical charge
D. to increase the wattage

(A) B C D

#5 In Exp. #4, what type of capacitor are we using?

A. an electrolytic capacitor
B. a ceramic disc capacitor
C. a polyester film capacitor
D. a variable capacitor

A B (C) D

#10 Does the capacitor in this circuit have polarity?

A. NO
B. can't tell
C. YES
D. its an inductor

(Form SQAK04)

QUICK-CHECK ANSWER KEY for Experiment 05 QUIZ
for Mr Circuit Electronics Training ("Speaker")

Place this sheet over top of the STUDENT QUIZ (offset a little to the left and then offset to the right) to compare the answers on this sheet to the answers that the student marked. Put an 'X' for each wrong answer.

Count the right answers and record the score of right answers in your grade book.

A B C **(D)**

#1 What would happen in this circuit if you reverse the polarity of the battery snap?

A. the speaker will burn out
B. it will not work at all
C. the speaker will whistle
D. it will work just fine

A B C D

#2 What do you think the purpose of the 10 Ohm resistor is in this circuit?

A. to increase the amount of current
B. to reduce the amount of current
C. to increase the capacitance
D. to decrease the inductance

(A) B C D

#3 When you reverse the polarity of the battery snap in this circuit, it affects the _____ of the speaker.

A. cone
B. magnet
C. volume
D. sound quality

A B **(C)** D

#4 Why does the sound stop when you leave the battery connected?

A. the magnet gets weak
B. the speaker burns out
C. the cone stops moving
D. the current increases

(A) B C D

#5 Why does the speaker make a 'click' when you connect and when you disconnect the battery?

A. the cone moves each time
B. the speaker is alive
C. the magnet is weak
D. the speaker is round

#6 What is the name of the part we learn about in Exp. #5?

A. a speaker
B. a capacitor
C. a resistor
D. a photocell

(A) B C D

#7 What is the function of the part we learn about in Exp. #5?

A. reduce the amount of current flow
B. to store electrons and protons
C. transform electrical energy to sound waves
D. to look nice in a circuit

A B **(C)** D

#8 What part of a Speaker moves when current flows through it?

A. the bracket
B. the magnet
C. the handle
D. the cone

A B C **(D)**

#9 What sound comes out of a speaker when a steady DC current is connected to its coil?

A. it makes a steady tone
B. it makes a click and then becomes silent
C. it plays music
D. it sounds like a siren

A **(B)** C D

#10 What kind of device is a Speaker?

A. rectifying device
B. electromechanical device
C. photoelectric device
D. semiconductor device

A **(B)** C D

(Form SQAK05)

QUICK-CHECK ANSWER KEY for Experiment 06 QUIZ
for Mr Circuit Electronics Training ("Diode")

Place this sheet over top of the STUDENT QUIZ (offset a little to the left and then offset to the right) to compare the answers on this sheet to the answers that the student marked. Put an 'X' for each wrong answer.

Count the right answers and record the score of right answers in your grade book.

A (B) C D

#1 In Experiment #6, what is the component that you learned about?

A. a capacitor
B. a diode
C. an LED
D. a battery snap

A (B) C D

#2 A diode allows current to flow through it _____ .

A. freely both ways
B. in one direction only
C. if it is warm
D. only if there is a resistor in the circuit

A B (C) D

#3 How is the Cathode side of a diode marked on the diode itself?

A. with a double color stripe
B. with an arrow
C. with a white band around one end
D. with an asterisk

A (B) C D

#4 A diode allows an easy flow of electrons from _____ to _____ .

A. top, bottom
B. bottom, top
C. Anode, Cathode
D. Cathode, Anode

A (B) C D

#5 In Exp. #6, what component do we use to indicate that current is flowing?

A. a speaker
B. an LED
C. an electrolytic capacitor
D. a disc capacitor

#6 The arrow on the schematic symbol for a diode points to the _____ .

A. Anode
B. Gate
C. Door
D. Cathode

A B C (D)

#7 An LED is also a type of _____ .

A. inductor
B. diode
C. capacitor
D. speaker

A (B) C D

#8 If we were to increase the value of the resistor in the circuit from 220 Ohms to 1000 Ohms, how would that affect the LED?

A. the LED would increase its brightness
B. the LED would reduce in brightness
C. the current flow in the LED would increase
D. the brightness would stay the same

A (B) C D

#9 If the LED lights up the same regardless of the polarity of the diode in the circuit, what would we assume?

A. the LED is defective
B. the diode is working fine
C. the battery is weak
D. the diode is defective

A B C (D)

#10 A diode is considered a _____ .

A. simple resistor
B. one-way gate
C. a variable resistor
D. a simple capacitor

A (B) C D

(Form SQAK06)

QUICK-CHECK ANSWER KEY for Experiment 07 QUIZ
for Mr Circuit Electronics Training ("SCR - Silicon Control Rectifier")

Place this sheet over top of the STUDENT QUIZ (offset a little to the left and then offset to the right) to compare the answers on this sheet to the answers that the student marked. Put an 'X' for each wrong answer.

Count the right answers and record the score of right answers in your grade book.

A B C (D)

#1 What are the three connections on an SCR?

A. Input, Output, and Neutral
B. Up, Down, Middle
C. Right, Left, Straight
D. Cathode, Anode, Gate

A B (C) D

#2 Once an SCR is turned on, in order to turn it off, you need to _____ .

A. remove the voltage on the Gate
B. clap your hands
C. remove the power from the entire circuit
D. double the voltage

A B C (D)

#3 Most of the electron current flowing through an SCR is flowing through the _____ .

A. Anode to Cathode circuit
B. the Gate circuit
C. Anode to Gate circuit
D. Cathode to Anode circuit

A B (C) D

#4 To turn on an SCR in a circuit, you need a _____ .

A. large current on the Gate
B. small positive voltage on the Anode
C. small positive voltage on the Gate
D. large current on the Cathode

A B (C) D

#5 The Gate lead on the SCR in this experiment is marked by the _____ .

A. metal tab on the SCR
B. left lead on the SCR
C. beveled edge on the SCR
D. center lead on the SCR

A B (C) D

#6 The letters SCR in Exp. #7 stand for 'Silicon Controlled Rectifier'. How many connection leads does an SCR have?

A. 5
B. 4
C. 3
D. 2

A B (C) D

#7 If a positive voltage is applied to the Gate of an SCR, what happens in the circuit?

A. the electrons flow through the SCR
B. the SCR will turn off
C. the resistance of the SCR increases
D. absolutely nothing

(A) B C D

#8 The Anode lead is connected internally to the _____ on the SCR.

A. metal tab with a hole in it
B. to the Gate lead
C. to the Cathode lead
D. to the round edge on the SCR

(A) B C D

#9 If we reverse the polarity of the battery snap in the circuit, what will happen?

A. it will not work
B. it will work just fine
C. the SCR will burn out
D. the LED will self-destruct

A B (C) D

#10 An SCR is considered to be a _____ .

A. a variable resistor
B. a variable capacitor
C. "a diode with a difference"
D. a good potentiometer

(Form SQAK07)

QUICK-CHECK ANSWER KEY for Experiment 08 QUIZ
for Mr Circuit Electronics Training ("NPN Transistor")

Place this sheet over top of the STUDENT QUIZ (offset a little to the left and then offset to the right) to compare the answers on this sheet to the answers that the student marked. Put an 'X' for each wrong answer.

Count the right answers and record the score of right answers in your grade book.

A
B
C
D

#1 The NPN transistor we use in this experiment is referred to as a _____ transistor?

A. Bipolar
B. Dual
C. Double
D. integrated

A
B
C
D

#2 The schematic symbol of an NPN Transistor shows an arrow pointing to the _____ lead.

A. cathode
B. emitter
C. base
D. collector

A
B
C
D

#3 The leads on an NPN transistor are called the Emitter, Base, and _____ .

A. Collector
B. Cathode
C. Anode
D. Gate

A
B
C
D

#4 Most of the current traveling through an NPN transistor travels through the _____ circuit.

A. Emitter-Base
B. Emitter-Collector
C. Base-Base
D. Cathode-Anode

A
B
C
D

#5 In an NPN transistor, the direction of the electron flow is from _____ .

A. Base to Emitter
B. Base to Base
C. Emitter to Emitter
D. Emitter to Collector

A
B
C
D

#6 In this NPN transistor circuit, which LED should conduct the most electron current?

A. LED 1
B. LED 2
C. LED 3
D. LED 4

A
B
C
D

#7 In this circuit, the Cathode of LED 2 is connected to the _____ of the NPN transistor.

A. Collector
B. Base
C. Emitter
D. Gate

A
B
C
D

#8 A transistor controls a large amount of current with _____ .

A. a small amount of current
B. a large amount of current
C. a small amount of voltage
D. a huge amount of voltage

A
B
C
D

#9 An NPN transistor has three pins: a Collector, a Base, and _____ .

A. an Anode
B. an Emitter
C. a Cathode
D. a Gate

A
B
C
D

#10 The process of having a small current controlling a large current is called _____ .

A. increase of the voltage
B. conservation of resources
C. reduction
D. amplification

(Form SQAK08)

QUICK-CHECK ANSWER KEY for Experiment 09 QUIZ
for Mr Circuit Electronics Training ("PNP Transistor")

Place this sheet over top of the STUDENT QUIZ (offset a little to the left and then offset to the right) to compare the answers on this sheet to the answers that the student marked. Put an 'X' for each wrong answer.

Count the right answers and record the score of right answers in your grade book.

A
(B)
C
D

#1 In this circuit, the Emitter of the PNP is connected to the _____ of the battery.

A. negative
B. positive
C. neutral
D. ground

(A)
B
C
D

#2 In Exp. #9, we use LED brightnesses to compare the amount of _____ flowing.

A. current
B. voltage
C. resistance
D. air

A
B
(C)
D

#3 In a PNP transistor circuit, which current is greater?

A. the Collector to Emitter current
B. the Base to Emitter current
C. the Emitter to Collector current
D. the Emitter to Base current

A
B
C
(D)

#4 In a transistor circuit, when there is no base current, there is _____ .

A. no voltage
B. more collector current
C. no collector current
D. no anode voltage

(A)
B
C
D

#5 In Exp. #9, the PNP transistor is working as _____.

A. an amplifier
B. a voltage regulator
C. a resistor
D. a variable capacitor

#6 The PNP transistor we use in this experiment is referred to as a _____ transistor?

A. Bipolar
B. Dual
C. Double
D. Integrated

(A)
B
C
D

#7 The schematic symbol of a PNP Transistor shows an arrow pointing to the _____ lead.

A. Cathode
B. Emitter
C. Base
D. Collector

A
B
(C)
D

#8 A transistor controls a large amount of current with _____ .

A. a small amount of current
B. a large amount of current
C. a small amount of voltage
D. a huge amount of voltage

(A)
B
C
D

#9 A PNP transistor has three pins: a Collector pin, a Base pin, and _____ pin.

A. an Anode
B. an Emitter
C. a Cathode
D. a Gate

A
(B)
C
D

#10 In a PNP transistor, the direction of the electron flow is from _____ .

A. Base to Base
B. Emitter to Collector
C. Emitter to Base
D. Collector to Emitter

A
B
C
(D)

(Form SQAK09)

QUICK-CHECK ANSWER KEY for Experiment 10 QUIZ
for Mr Circuit Electronics Training ("Two-Transistor Oscillator")

Place this sheet over top of the STUDENT QUIZ (offset a little to the left and then offset to the right) to compare the answers on this sheet to the answers that the student marked. Put an 'X' for each wrong answer.

Count the right answers and record the score of right answers in your grade book.

A
(B)
C
D

#1 This two-transistor oscillator uses an NPN transistor and _____ .

A. an SCR
B. a PNP Transistor
C. a Diode
D. a Potentiometer

(A)
B
C
D

#2 In this two-transistor oscillator the Collector of transistor Q2 is connected to the Base of transistor Q1 through a _____ .

A. capacitor
B. resistor
C. wire
D. speaker

A
B
(C)
D

#3 In this two-transistor oscillator circuit, the Emitter of Q1 3904 is connected to the Base of transistor Q2 through a _____?

A. capacitor
B. resistor
C. wire
D. speaker

(A)
B
C
D

4 If we reverse the polarity of the battery snap on the circuit, what will happen?

A. The circuit will not work.
B. It will work just fine.
C. The transistors will burn out.
D. The speaker will self-destruct.

A
B
C
(D)

#5 What happens if we increase the value of resistor R1 in the circuit?

A. it will increase the frequency
B. it will make no change in frequency
C. it will cause the speaker to jam
D. it will lower the frequency

#6 In Exp. #10, how many transistors do we use to make an oscillator?

A. 5
B. 4
C. 3
D. 2

A
B
C
(D)

#7 The circuit in Exp. #10 generates a tone by turning the _____ on and off at an audio frequency.

A. capacitor
B. speaker
C. battery
D. capacitance

A
(B)
C
D

#8 Generally, an audio signal (one that can be heard by your ears) is in what frequency range?

A. 1 million to 10 million (cycles per second)Hz
B. 10 Hz to 16,000 Hz
C. 100 thousand Hz to 100 megahertz
D. zero to five Hz

A
(B)
C
D

#9 In electronics, one Hz (Hertz) means one change per _____ or one cycle per _____ .

A. second, second
B. minute, minute
C. hour, hour
D. day, day

(A)
B
C
D

#10 What does the 10 Ohm resistor do in the circuit ?

A. increase the current through the speaker
B. vary the frequency of the oscillator
C. reduce current through the speaker
D. lower the frequency of the oscillator

A
B
(C)
D

(Form SQAK10)

QUICK-CHECK ANSWER KEY for Experiment 11 QUIZ
for Mr Circuit Electronics Training ("555 Timer IC")

Place this sheet over top of the STUDENT QUIZ (offset a little to the left and then offset to the right) to compare the answers on this sheet to the answers that the student marked. Put an 'X' for each wrong answer.

Count the right answers and record the score of right answers in your grade book.

A
B
C
D

#1 How many pins does a 555 Timer IC have?

A. 8
B. 3
C. 6
D. 12

A
B
C
D

#2 What pin is the output pin on the 555 Timer?

A. 8
B. 3
C. 6
D. 12

A
B
C
D

#3 If you connect an oscilloscope to the output Pin 3 on this circuit when operating, what might you see?

A. pulses
B. aliens
C. resistance values
D. inductance variations

A
B
C
D

#4 What is the value of the capacitor in microfarads connected to Pin 2 of the 555 Timer IC in this circuit?

A. 1000uF
B. 10uF
C. 33uF
D. 470uF

A
B
C
D

#5 If we reverse the polarity of the battery snap on the circuit, what will happen?

A. It will work just fine.
B. You might destroy the 555 Timer IC.
C. The LED will burn out.
D. The LED will self-destruct.

A
B
C
D

#6 What does the indentation or marking on the top end of the 555 Timer IC help you find?

A. Pin 5
B. Pin 4
C. Pin 1
D. the bottom of the IC

A
B
C
D

#7 When a 555 Timer IC is working as a 'clock', it puts out pulses on _____ .

A. Pin 8
B. Pin 2
C. Pin 5
D. Pin 3

A
B
C
D

#8 When you are counting the pins on a 555 Timer IC, you count them _____ .

A. up and down
B. clockwise
C. by tens
D. counter-clockwise

A
B
C
D

#9 When installing the 555 Timer IC on the solderless circuit board, you install it _____ .

A. always on the right end of the board
B. with pin 1 in hole 1a
C. across the center channel
D. on the bottom of the board

A
B
C
D

#10 When a 555 Timer IC is working as a 'timer', it puts out a voltage on _____ for a set period of time and then shuts off automatically.

A. Pin 3
B. Pin 5
C. Pin 8
D. Pin 2

(Form SQAK11)

QUICK-CHECK ANSWER KEY for Experiment 12 QUIZ
for Mr Circuit Electronics Training ("Burglar Alarm")

Place this sheet over top of the STUDENT QUIZ (offset a little to the left and then offset to the right) to compare the answers on this sheet to the answers that the student marked. Put an 'X' for each wrong answer.

Count the right answers and record the score of right answers in your grade book.

A
B
C
D

#1 How do you turn off this alarm once it is tripped?

A. touch a negative voltage to the Gate
B. open the normally-open switch
C. remove power from the circuit
D. close the normally-closed switch

#6 When the 33 Ohm resistor is connected to the Gate, what happens?

A. the alarm is turned off
B. the alarm is triggered
C. the alarm is reset
D. nothing

A
B
C
D

A
B
C
D

#2 What item in this alarm circuit indicates that the alarm has been tripped?

A. the LED
B. the Diode
C. the SCR
D. the resistor

#7 The cathode of the LED is connected to what pin on the SCR?

A. the Gate
B. the Cathode
C. the Emitter
D. the Anode

A
B
C
D

A
B
C
D

#3 Which component limits the current flowing through the LED?

A. the SCR
B. the 220 ohm resistor
C. the Diode
D. the 0.1 disc capacitor

#8 How many pins are there on an SCR.

A. 1
B. 2
C. 3
D. 4

A
B
C
D

A
B
C
D

#4 To trigger the alarm, which lead on the SCR has to receive a small positive voltage?

A. EMITTER
B. CATHODE
C. ANODE
D. GATE

#9 In this circuit, there are how many switches to trigger the alarm circuit?

A. 1
B. 2
C. 3
D. 5

A
B
C
D

A
B
C
D

#5 Where would you connect a buzzer to this alarm circuit?

A. across R3 and the LED
B. across R1 and S1
C. across R2 and D1
D. across the SCR

#10 How many capacitors do we use in this circuit?

A. 3
B. 2
C. 1
D. 4

A
B
C
D

(Form SQAK12)

QUICK-CHECK ANSWER KEY for Experiment 13 QUIZ
for Mr Circuit Electronics Training ("Automatic Night Light")

Place this sheet over top of the STUDENT QUIZ (offset a little to the left and then offset to the right) to compare the answers on this sheet to the answers that the student marked. Put an 'X' for each wrong answer.

Count the right answers and record the score of right answers in your grade book.

A (B) C D

#1 This Automatic Night Light will turn on automatically _____?

A. when there is light.
B. when there is darkness.
C. at noon each day.
D. when it is humid outside.

A B (C) D

#2 How many LEDs are there in this circuit?

A. 1
B. 3
C. 2
D. 5

A (B) C D

#3 What is the purpose of the 47 Ohm resistor in the circuit?

A. to increase the current in the circuit
B. to serve as a fuse for the circuit
C. to increase the brightness of the LEDs
D. limit the current through the LEDs

A (B) C D

#4 What is the purpose of the Potentiometer in the circuit?

A. to make the LEDs blink
B. to adjust the sensitivity of the Photocell
C. to adjust the loudness
D. to make the battery last longer

A (B) C D

#5 If we reverse the polarity of the battery snap on the circuit, what will happen?

A. It will work just fine.
B. The LEDs will not light up.
C. The LEDs will burn out.
D. The LEDs will self-destruct.

#6 The LEDs receive their current from which pin on the NPN transistor?

A. the Collector
B. the Emitter
C. the Base
D. the Gate

(A) B C D

#7 Resistor R2, 16k Ohms, is connected directly to which terminal on the 9-Volt battery?

A. the negative
B. the center
C. the neutral
D. the positive

A B C (D)

#8 The potentiometer has 3 connections. How many do we use in this circuit? .

A. 0
B. 2
C. 3
D. 1

A (B) C D

#9 What are the colors on Resistor R1, 47 Ohms?

A. yellow, violet, black, gold
B. brown, red, black, gold
C. green, green, brown, gold
D. gray, blue, brown, gold

(A) B C D

#10 This circuit is used to turn on the LEDs _____.

A. when the weather is hot
B. during the day
C. at night
D. when it is a humid day

A B (C) D

(Form SQAK13)

QUICK-CHECK ANSWER KEY for Experiment 14 QUIZ
for Mr Circuit Electronics Training ("DC to DC Power Supply")

Place this sheet over top of the STUDENT QUIZ (offset a little to the left and then offset to the right) to compare the answers on this sheet to the answers that the student marked. Put an 'X' for each wrong answer.

Count the right answers and record the score of right answers in your grade book.

A
B
C
D

#1 This circuit has an input of a fixed DC voltage and an output of _____?

A. a variable DC voltage
B. an AC voltage
C. a voltage higher than the input voltage
D. a voltage from -5V to 5V

A
B
C
D

#2 What is the maximum current that can be provided by this DC to DC Power Supply?

A. 10 milliamps
B. 3 Amps
C. 50 milliamps
D. 1 Amp

A
B
C
D

#3 You can use this power supply to supply voltage for _____ .

A. portable transistor radios
B. large HAM radios
C. large Televisions and Stereos
D. microwave ovens

A
B
C
D

#4 In this circuit, transistor Q1 is used as _____?

A. a capacitor
B. an inductor
C. a fixed capacitance
D. an adjustable resistor

A
B
C
D

#5 In this circuit, the potentiometer is used to _____ .

A. vary the output voltage
B. adjust the capacitance
C. as a variable inductor
D. keep the LED from burning out

A
B
C
D

#6 The voltage applied to the base of the transistor controls the _____ of the transistor.

A. external capacitance
B. internal resistance
C. external resistance
D. internal capacitance

A
B
C
D

#7 The potentiometer controls the voltage applied to the _____ of the transistor.

A. Collector
B. Emitter
C. Anode
D. Base

A
B
C
D

#8 The output of this DC to DC Power Supply will be a maximum when the _____ of the transistor is close to 0 volts.

A. current applied to the Collector
B. voltage applied to the Base
C. voltage applied to the Emitter
D. current applied to the Base

A
B
C
D

#9 When the _____ of transistor Q1 is high, the output voltage will be at minimum.

A. external capacitance
B. internal capacitance
C. external resistance
D. internal resistance

A
B
C
D

#10 In this circuit, the brightness of the LED is an indicator of the _____ .

A. output voltage
B. input voltage
C. input current
D. output capacitance

(Form SQAK14)

QUICK-CHECK ANSWER KEY for Experiment 15 QUIZ
for Mr Circuit Electronics Training ("Electronic Metronome")

Place this sheet over top of the STUDENT QUIZ (offset a little to the left and then offset to the right) to compare the answers on this sheet to the answers that the student marked. Put an 'X' for each wrong answer.

Count the right answers and record the score of right answers in your grade book.

A
(B)
C
D

#1 This metronome circuit is built using _____ .

A. a 555 Timer IC
B. a two-transistor oscillator
C. an SCR
D. a quad amplifier

A
B
(C)
D

#6 In this circuit, the speaker is connected to the _____ of transistor Q2.

A. Base
B. Anode
C. Collector
D. Emitter

A
B
C
(D)

#2 The potentiometer is used to adjust the _____ .

A. the current through the speaker
B. the capacitance of the transistors
C. the loudness of the speaker
D. speed of the oscillation

A
(B)
C
D

#7 Transistor Q1 in this circuit is _____ .

A. a PNP Transistor
B. an NPN Transistor
C. a variable diode
D. a capacitance

A
B
C
(D)

#3 The Emitter of transistor Q1 is connected to the _____ of transistor Q2.

A. Collector
B. Anode
C. Emitter
D. Base

A
(B)
C
D

#8 Based on your understanding of a two-transistor oscillator circuit, the purpose of Capacitor C1 is to _____ .

A. reduce the current in the circuit
B. help control the speed of the oscillator
C. reduce the resistance of the circuit.
D. reduce the voltage used in the circuit

(A)
B
C
D

#4 The potentiometer varies the _____ on the Base of transistor Q1.

A. voltage
B. capacitance
C. resistance
D. current

(A)
B
C
D

#9 The _____ of Q2 is connected directly to the positive of the battery.

A. Emitter
B. Collector
C. Base
D. Anode

(A)
B
C
D

#5 As you adjust the potentiometer from 0 Ohms to its maximum Ohms, the oscillator will _____ in speed.

A. decrease
B. increase
C. remain the same
D. not be affected

A
B
C
(D)

#10 The positive lead on Capacitor C1 is connected to the _____ of transistor Q1.

A. Collector
B. Anode
C. Emitter
D. Base

(Form SQAK15)

QUICK-CHECK ANSWER KEY for Experiment 16 QUIZ
for Mr Circuit Electronics Training ("Electronic Motorcycle")

Place this sheet over top of the STUDENT QUIZ (offset a little to the left and then offset to the right) to compare the answers on this sheet to the answers that the student marked. Put an 'X' for each wrong answer.

Count the right answers and record the score of right answers in your grade book.

A
(B)
C
D

#1 This motorcycle circuit is built using _____ .

A. a 555 Timer IC
B. a two-transistor oscillator
C. an SCR
D. a quad amplifier

A
B
(C)
D

#6 In this circuit, the speaker is connected to the _____ of transistor Q2.

A. Base
B. Anode
C. Collector
D. Emitter

A
(D)
C
D

#2 The potentiometer is used to adjust the _____ .

A. the current through the speaker
B. the capacitance of the transistors
C. the loudness of the speaker
D. speed of the oscillation

(A)
B
C
D

#7 Transistor Q2 in this circuit is _____ .

A. a PNP Transistor
B. an NPN Transistor
C. a variable diode
D. is a capacitance

A
B
(C)
D

#3 The Emitter of transistor Q1 is connected to the _____ of transistor Q2.

A. Collector
B. Anode
C. Emitter
D. Base

A
(B)
C
D

#8 Based on your understanding of a two-transistor oscillator circuit, the purpose of Capacitor C1 is to _____ .

A. reduce the current in the circuit
B. help control the speed of the oscillator
C. reduce the resistance of the circuit.
D. reduce the voltage used in the circuit

(A)
B
C
D

#4 The potentiometer varies the _____ on the Base of transistor Q1.

A. voltage
B. capacitance
C. resistance
D. current

(A)
B
C
D

#9 The _____ of Q2 is connected through a 10 Ohm resistor to the positive of the battery.

A. Emitter
B. Collector
C. Base
D. Anode

(A)
B
C
D

#5 As you adjust the potentiometer from 0 Ohms to its maximum Ohms, the oscillator will _____ in speed.

A. decrease
B. increase
C. remain the same
D. not be affected

A
B
C
(D)

#10 The positive lead on Capacitor C1 is connected to the _____ of transistor Q1 and to the potentiometer.

A. Collector
B. Anode
C. Emitter
D. Base

(Form SQAK16)

QUICK-CHECK ANSWER KEY for Experiment 17 QUIZ
for Mr Circuit Electronics Training ("Railroad Lights")

Place this sheet over top of the STUDENT QUIZ (offset a little to the left and then offset to the right) to compare the answers on this sheet to the answers that the student marked. Put an 'X' for each wrong answer.

Count the right answers and record the score of right answers in your grade book.

A (B) C D

#1 This circuit uses _____ working as a clock?

A. an NPN Transistor
B. a 555 Timer IC
C. a PNP Transistor
D. a Potentiometer

A B C (D)

#2 When pin 3 on the 555 Timer is positive, _____ will be forward biased.

A. LED 1
B. Resistor R1
C. Resistor R3
D. LED 2

A B (C) D

#3 The two LEDs in this circuit are installed in _____ polarity.

A. the same
B. amplifying
C. opposite
D. dual

A (B) C D

#4 What is the value of the capacitor connected to Pin 2 of the 555 Timer IC in this circuit?

A. 1000uF
B. 10uF
C. 33uF
D. 470uF

A (B) C D

#5 If we reverse the polarity of the battery snap on the circuit, what will happen?

A. it will work just fine
B. you might destroy the 555 Timer IC
C. the LED will burn out
D. the LED will self-destruct

A B (C) D

#6 The speed if the blinking LEDs is _____ .

A. variable
B. super fast
C. fixed
D. super slow

A B (C) D

#7 When this circuit is working, the LEDs will _____ ?

A. blink on and off alternately
B. remain off permanently
C. remain on
D. get hot and self-destruct

(A) B C D

#8 When an LED is _____ it means that the Anode is positive and the Cathode is negative.

A. reverse-biased
B. forward-biased
C. will not turn on
D. will change from Red to Green

A (B) C D

#9 When an LED is _____ it means that the Anode is negative and the Cathode is positive.

A. reverse-biased
B. forward-biased
C. will not turn on
D. will change from Red to Green

(A) B C D

#10 When an LED is forward biased, it will _____ .

A. self-destruct
B. turn on
C. get hot
D. turn off

A (B) C D

(Form SQAK17)

QUICK-CHECK ANSWER KEY for Experiment 18 QUIZ
for Mr Circuit Electronics Training ("Variable Speed Lights")

Place this sheet over top of the STUDENT QUIZ (offset a little to the left and then offset to the right) to compare the answers on this sheet to the answers that the student marked. Put an 'X' for each wrong answer.

Count the right answers and record the score of right answers in your grade book.

A
B
(C)
D

#1 This circuit uses _____ working as a clock?

A. an NPN Transistor
B. a PNP Transistor
C. a 555 Timer IC
D. a Potentiometer

A
B
(C)
D

#2 You can adjust the speed of the blinking lights by using _____ .

A. the Diode
B. the LED
C. the Potentiometer
D. transistor

A
B
C
(D)

#3 The two LEDs in this circuit are installed in _____ polarity.

A. the same
B. amplifying
C. dual
D. opposite

A
B
C
(D)

#4 What is the value of the capacitor connected to Pin 2 of the 555 Timer IC in this circuit?

A. 1000uF
B. 330uF
C. 33uF
D. 10uF

A
B
(C)
D

#5 If we reverse the polarity of the battery snap on the circuit, what will happen?

A. it will work just fine
B. the LED will burn out
C. you might destroy the 555 Timer IC
D. the LED will self-destruct

(A)
B
C
D

#6 LED 1 is connect to pin 3 of the 555 Timer IC through _____ .

A. a 220 Ohm resistor
B. a 10uF capacitor
C. a 6.8k Ohm resistor
D. a 1k Ohm resistor

A
B
(C)
D

#7 When this circuit is working, the LEDs will _____ ?

A. remain on
B. remain off permanently
C. blink on and off alternately
D. get hot and self-destruct

A
B
C
(D)

#8 When an LED is _____ it means that the Anode is positive and the Cathode is negative.

A. reverse-biased
B. will not turn on
C. forward biased
D. will change from Red to Green

A
B
C
(D)

#9 When an LED is _____ it means that the Anode is negative and the Cathode is positive.

A. will change from Red to Green
B. forward-biased
C. will not turn on
D. reverse-biased

A
B
(C)
D

#10 A Potentiometer is also known as _____ .

A. variable transistor
B. fixed capacitor
C. a variable resistor
D. fixed resistor

(Form SQAK18)

QUICK-CHECK ANSWER KEY for Experiment 19 QUIZ
for Mr Circuit Electronics Training ("Continuity Tester")

Place this sheet over top of the STUDENT QUIZ (offset a little to the left and then offset to the right) to compare the answers on this sheet to the answers that the student marked. Put an 'X' for each wrong answer.

Count the right answers and record the score of right answers in your grade book.

A
B
C
D

#1 This circuit uses 555 Timer IC working as a _____ .

A. an amplifier
B. a timer
C. a clock
D. a light generator

A
B
C
D

#2 The loudness of the tone is _____ .

A. adjustable
B. fixed
C. controlled by Resistor R1
D. controlled by Capacitor C1

A
B
C
D

#3 The speaker in this circuit is connected to the _____ of transistor Q1.

A. Gate
B. Emitter
C. Collector
D. Base

A
B
C
D

#4 What is the value of the capacitor connected to Pin 2 of the 555 Timer IC in this circuit?

A. 0.01uF
B. 330uF
C. 33uF
D. 10uF

A
B
C
D

#5 If we reverse the polarity of the battery snap on the circuit, what will happen?

A. you might destroy the 555 Timer IC
B. the LED will burn out
C. it will work just fine
D. the LED will self-destruct

#6 Resistor R3 is connected to _____ of the 555 Timer IC.

A. Pin 3
B. Pin 4
C. Pin 1
D. Pin 6

A
B
C
D

#7 When this circuit is working, the speaker will _____ when there is continuity.

A. remain silent
B. self-destruct
C. emit a tone
D. get hot

A
B
C
D

#8 When you touch the two probes together, the speaker will _____ .

A. remain silent
B. self-destruct
C. get hot
D. emit a tone

A
B
C
D

#9 One probe is connected to R1 and the other one is connected _____ .

A. to the negative of the battery
B. to the speaker
C. to the 0.01uF capacitor
D. to the positive of the battery

A
B
C
D

#10 This circuit emits _____ signal.

A. an inaudible
B. an rf
C. an ultrasonic
D. an audio

A
B
C
D

(Form SQAK19)

QUICK-CHECK ANSWER KEY for Experiment 20 QUIZ
for Mr Circuit Electronics Training ("Audio Generator")

Place this sheet over top of the STUDENT QUIZ (offset a little to the left and then offset to the right) to compare the answers on this sheet to the answers that the student marked. Put an 'X' for each wrong answer.

Count the right answers and record the score of right answers in your grade book.

A
B
C
D

#1 This circuit uses 555 Timer IC working as a _____ .

A. a clock
B. a timer
C. an amplifier
D. a light generator

A
B
C
D

#2 The loudness of the tone is _____ .

A. adjustable
B. controlled by Resistor R1
C. fixed
D. controlled by Capacitor C1

A
B
C
D

#3 The speaker in this circuit is connected to the _____ of transistor Q1.

A. Collector
B. Emitter
C. Gate
D. Base

A
B
C
D

#4 What is the value of the capacitor connected to Pin 2 of the 555 Timer IC in this circuit?

A. 10uF
B. 330uF
C. 33uF
D. 0.01uF

A
B
C
D

#5 If we reverse the polarity of the battery snap on the circuit, what will happen?

A. the LED will self-destruct
B. the LED will burn out
C. it will work just fine
D. you might destroy the 555 Timer IC

A
B
C
D

#6 Resistor R2 is connect to _____ of the 555 Timer IC.

A. Pin 3
B. Pin 4
C. Pin 7
D. Pin 6

A
B
C
D

#7 When this circuit is working, the speaker will _____ .

A. remain silent
B. self-destruct
C. emit a variable audiotone
D. get hot

A
B
C
D

#8 To vary the frequency of this oscillator, you adjust _____ .

A. the potentiometer
B. the transistor
C. 555 Timer IC
D. battery snap

A
B
C
D

#9 Pins 4 and 8 on the 555 Timer IC are _____ .

A. connected together
B. are insulated from each other
C. do not need to be connected
D. are not important in this circuit

A
B
C
D

#10 The word 'tone' is the same thing as _____ .

A. loudness
B. pitch
C. excitation
D. bias

(Form SQAK20)

QUICK-CHECK ANSWER KEY for Experiment 21 QUIZ
for Mr Circuit Electronics Training ("Electronic Police Siren")

Place this sheet over top of the STUDENT QUIZ (offset a little to the left and then offset to the right) to compare the answers on this sheet to the answers that the student marked. Put an 'X' for each wrong answer.

Count the right answers and record the score of right answers in your grade book.

A
B
C
(D)

#1 This circuit uses 555 Timer IC working as a _____ .

A. a light generator
B. a timer
C. an amplifier
D. clock

A
B
C
(D)

#2 The loudness of the tone is _____ .

A. adjustable
B. controlled by Resistor R1
C. controlled by Capacitor C1
D. fixed

A
B
C
(D)

#3 The speaker in this circuit is connected to the _____ of transistor Q1.

A. Base
B. Emitter
C. Gate
D. Collector

A
B
C
(D)

#4 What is the value of the capacitor connected to Pin 6 of the 555 Timer IC in this circuit?

A. 10uF
B. 330uF
C. 33uF
D. 0.01uF

A
B
(C)
D

#5 If we reverse the polarity of the battery snap on the circuit, what will happen?

A. the LED will self-destruct
B. the LED will burn out
C. you might destroy the 555 Timer IC
D. it will work just fine

A
(B)
C
D

#6 Resistors R5 and R6 are _____ .

A. not connected
B. connected
C. not important
D. are connected to pin 7

A
B
C
D

#7 When this circuit is working, the speaker will _____ .

A. remain silent
B. self-destruct
C. emit a variable audiotone
D. get hot

A
B
(C)
D

#8 To vary the frequency of this oscillator, you _____ .

A. adjust the potentiometer
B. use the pushbutton switch
C. use the battery snap
D. remove resistor R1

A
(B)
C
D

#9 The rising and falling of the frequency of the oscillator is controlled by _____ .

A. the distance C2 is from the battery
B. charging and discharging of C2
C. charging and discharging of C1
D. the size of the speaker

A
(B)
C
D

#10 Switch S1 is in series with _____ .

A. C1 and C2
B. R1 and R2
C. R5 and R6
D. R3 and R4

A
B
(C)
D

(Form SQAK21)

QUICK-CHECK ANSWER KEY for Experiment 22 QUIZ
for Mr Circuit Electronics Training ("Wake-Up Alarm")

Place this sheet over top of the STUDENT QUIZ (offset a little to the left and then offset to the right) to compare the answers on this sheet to the answers that the student marked. Put an 'X' for each wrong answer.

Count the right answers and record the score of right answers in your grade book.

A B C (D)

#1 This circuit uses a _____ to sense light intensity?

A. an SCR
B. a 555 Timer IC
C. a transistor
D. a Photocell

A (B) C D

#2 What pin on the 555 Timer is connected to a 220 Ohm resistor?

A. 8
B. 3
C. 6
D. 12

A B (C) D

#3 With this circuit, you can generate a variety of interesting _____ by shadowing the surface of the Photocell with your hand.

A. weather conditions
B. electronic displays
C. light displays
D. sound effects

A B (C) D

#4 What is the value of the capacitor connected to Pin 2 and Pin 6 of the 555 Timer IC in this circuit?

A. 0.01uF
B. 10uF
C. 0.1uF
D. 470uF

(A) B C D

#5 How many pins on the 555 Timer IC do we use in this circuit?

A. 7
B. 3
C. 8
D. 1

(A) B C D

#6 Pins 4 and 8 of the 555 Timer IC are _____ .

A. connected
B. are not connected
C. are isolated from each other
D. are not important

A B C D

#7 When the Photocell receives a lot of light, the alarm will _____.

A. go silent
B. make noise
C. burn up
D. give off moisture

A (B) C D

#8 To increase the amplitude of the pulses coming from the output Pin 3 of the 555 Timer IC we use _____ .

A. an SCR
B. a PNP transistor
C. an NPN Transistor
D. variable capacitor

A B (C) D

#9 The Photocell is connected to Pins 7, 6, and _____ .

A. 8
B. 4
C. 1
D. 2

A B C (D)

#10 Pin 1 of the 555 Timer IC is connected to the negative of the battery, to Pin 1 and _____ .

A. the Emitter of the NPN Transistor
B. the Collector of the PNP Transistor
C. the 100 Ohm resistor
D. the speaker

(A) B C D

(Form SQAK22)

QUICK-CHECK ANSWER KEY for Experiment 23 QUIZ
for Mr Circuit Electronics Training ("Variable Timer")

Place this sheet over top of the STUDENT QUIZ (offset a little to the left and then offset to the right) to compare the answers on this sheet to the answers that the student marked. Put an 'X' for each wrong answer.

Count the right answers and record the score of right answers in your grade book.

A B **C** D

#1 This circuit uses a 555 Timer IC as a _____ .

A. a clock
B. variable capacitor
C. a timer
D. variable resistor

A **B** C D

#2 What pin on the 555 Timer is connected to an LED?

A. 8
B. 3
C. 6
D. 12

A B C D

#3 All the pins on the 555 Timer IC are used in this circuit except _____ .

A. Pin 5
B. Pin 1
C. Pin 8
D. Pin 4

A B **C** D

#4 The Switch S1 is connected to Pin 2 and to _____ .

A. Pin 4
B. Pin 6
C. Pin 1
D. Pin 3

A B C D

#5 What is the purpose of the Potentiometer in this circuit?

A. to vary how long the LED is ON
B. to vary the volume of the sound
C. to count the pulses
D. to vary the brightness of the LED

A B C D

#6 If you want the LED to stay on longer, what would you do?

A. replace C1 with 1000uF
B. remove C1 from the circuit
C. reduce the capacitance of C1
D. short C1

A B C D

#7 The positive of C1 is connected to _____ .

A. Pin 4
B. Pin 2
C. Pin 6
D. Pin 8

A B **C** D

#8 To 'trigger' the timer to start, you _____ .

A. apply a positive voltage to Pin 1
B. remove the voltage from Pin 3
C. increase the voltage on Pin 8
D. apply a negative voltage to Pin 2

A B C **D**

#9 The Potentiometer is connected to _____ .

A. Pins 7 and 8
B. Pins 6 and 7
C. Pins 4 and 5
D. Pins 3 and 4

A **B** C D

#10 The amount of time the LED remains on after the timer is 'triggered' depends on the values of R2, R4, and _____ .

A. R3
B. C1
C. R1
D. the LED

A **B** C D

(Form SQAK23)

QUICK-CHECK ANSWER KEY for Experiment 24 QUIZ
for Mr Circuit Electronics Training ("Moisture Detector")

Place this sheet over top of the STUDENT QUIZ (offset a little to the left and then offset to the right) to compare the answers on this sheet to the answers that the student marked. Put an 'X' for each wrong answer.

Count the right answers and record the score of right answers in your grade book.

A
B
C
D

#1 This circuit uses a 555 Timer IC as a _____ .

A. a clock
B. variable capacitor
C. a timer
D. variable resistor

A
B
C
D

#2 What is connected to pin 3 on the 555 Timer IC?

A. an LED
B. a 220 Ohm resistor
C. a 10uF capacitor
D. a Photocell

A
B
C
D

#3 On the 555 Timer _____ .

A. only 6 pins are used
B. all but pin 5 are used
C. all 8 pins are used
D. all but pin 4 are used

A
B
C
D

#4 The purpose of this circuit is to _____ in soil.

A. sense moisture
B. sense vibrations
C. sense heat
D. sense light

A
B
C
D

#5 What controls the frequency of the output tone?

A. humidity in the air
B. the air temperature
C. resistance between the probes
D. the brightness of the sun

A
B
C
D

#6 The more moisture in the soil, the _____ .

A. the slower the blinks of the LED
B. the hotter the LED gets
C. the faster the blinks of the LED
D. the higher the input voltage

A
B
C
D

#7 Pin 1 of the 555 Timer IC is connected is connected to _____ .

A. the negative of the battery.
B. Pin 5
C. the positive of the battery
D. the positive of C1

A
B
C
D

#8 To make sure the circuit is working, you _____ .

A. touch the probes together
B. short capacitor C1
C. remove the LED
D. disconnect the battery

A
B
C
D

#9 Pins 6 and 2 are _____ .

A. not connected
B. connected
C. not important
D. determine the brightness of the LED.

A
B
C
D

#10 If the soil is dry, the LED will _____ .

A. blink
B. remain either ON or OFF
C. get hot
D. the LED will self-destruct

(Form SQAK24)

QUICK-CHECK ANSWER KEY for Experiment 25 QUIZ
for Mr Circuit Electronics Training ("Code Oscillator")

Place this sheet over top of the STUDENT QUIZ (offset a little to the left and then offset to the right) to compare the answers on this sheet to the answers that the student marked. Put an 'X' for each wrong answer.

Count the right answers and record the score of right answers in your grade book.

A B C (D)

#1 This circuit uses a 555 Timer IC as _____ .

A. a variable resistor
B. a variable capacitor
C. a timer
D. a clock

(A) B C D

#6 The loudness of the emitted tone _____ .

A. is fixed
B. is adjustable by the value of R1
C. is adjustable by the value of C1
D. is controlled by S1

A (B) C D

#2 R3 is connected to pin 3 on the 555 Timer IC and to the _____ on Q1.

A. Emitter
B. Base
C. Collector
D. Anode

A B C (D)

#7 If you do not press the pushbutton switch, the circuit _____ .

A. will consume power
B. will cause the speaker to emit a tone
C. will apply voltage to the 555 Timer IC
D. will not consume power

A (B) C D

#3 On the 555 Timer _____ .

A. only 6 pins are used
B. all but pin 5 are used
C. all 8 pins are used
D. all but pin 4 are used

(A) B C D

#8 To make sure the circuit is working, you _____ .

A. press the pushbutton switch to make a tone
B. short capacitor C1
C. remove the LED
D. disconnect the battery

A B (C) D

#4 The purpose of this circuit is to _____ as you press the pushbutton switch.

A. sense moisture
B. sense vibrations
C. emit an audio tone
D. sense light

A (B) C D

#9 Pins 4 and 8 are _____ .

A. not connected
B. connected
C. not important
D. determine the brightness of the LED.

(A) B C D

#5 How do you send Morse Code with this oscillator circuit?

A. you press the pushbutton switch
B. you squeeze resistor R1
C. you remove the 10 Ohm resistor
D. you adjust the speaker

A B (C) D

#10 What controls the speed at which you send code with this oscillator?

A. the battery
B. the speaker
C. you do.
D. the transistor

(Form SQAK25)

QUICK-CHECK ANSWER KEY for Experiment 26 QUIZ
for Mr Circuit Electronics Training ("Audible Water Detector")

Place this sheet over top of the STUDENT QUIZ (offset a little to the left and then offset to the right) to compare the answers on this sheet to the answers that the student marked. Put an 'X' for each wrong answer.

Count the right answers and record the score of right answers in your grade book.

A B **(C)** D

#1 This circuit uses a 555 Timer IC as _____ .

A. a variable resistor
B. a variable capacitor
C. a clock
D. a timer

(A) B C D

#2 R4 is connected to _____ and to the positive of the battery.

A. the speaker
B. the transistor
C. the 555 Timer IC
D. the capacitor C1

A B C **(D)**

#3 On the 555 Timer _____ .

A. only 6 pins are used
B. all but pin 4 are used
C. all 8 pins are used
D. all but pin 5 are used

(A) B C D

#4 The purpose of this circuit is to _____ .

A. sense the presence of water
B. sense vibrations
C. sense heat
D. sense light

(A) B C D

#5 What happens when this circuit is triggered?

A. you hear a tone in the speaker
B. you hear a loud cracking sound
C. an LED starts blinking
D. the capacitor gets hot

#6 The loudness of the emitted tone _____ .

A. is fixed
B. is adjustable by the value of R1
C. is adjustable by the value of C1
D. is controlled by S1

A B C D

#7 Resistors R1 and R2 _____ .

A. are connected
B. are not connected
C. are not important in the circuit
D. control the loudness of the speaker

A B C D

#8 To make sure the circuit is working, you _____ .

A. remove resistor R4
B. short capacitor C1
C. put the probes into water
D. disconnect the battery

A B **(C)** D

#9 Pins 1 and 3 of the 555 Timer IC are _____ .

A. not connected
B. connected
C. not important
D. determine the loudness of the speaker

A B C D

#10 Capacitor C1 is connected to Pin 1 and to _____ .

A. Pin 8
B. Pin 7
C. Pin 4
D. the Emitter of transistor Q1

A B C **(D)**

(Form SQAK26)

QUICK-CHECK ANSWER KEY for Experiment 27 QUIZ
for Mr Circuit Electronics Training ("English Police Siren")

Place this sheet over top of the STUDENT QUIZ (offset a little to the left and then offset to the right) to compare the answers on this sheet to the answers that the student marked. Put an 'X' for each wrong answer.

Count the right answers and record the score of right answers in your grade book.

#1 This circuit uses a 555 Timer IC as _____ .

A. a clock
B. a variable capacitor
C. a variable resistor
D. a timer

A (circled)

#2 R5 is connected to R1, R2 , Switch S1 and to _____.

A. Pin 7
B. the transistor
C. the speaker
D. capacitor C1

A (circled)

#3 On the 555 Timer _____ .

A. all but pin 5 are used
B. all but pin 4 are useds
C. all 8 pins are used
D. only 6 pins are used

A (circled)

#4 The purpose of this circuit is to _____ .

A. emit a siren sound
B. emit bird chirps
C. sense heat
D. sense light

A (circled)

#5 How do you make the circuit emit two tones?

A. connect and disconnect the battery
B. remove and replace the 10 Ohm resistor
C. press and release the pushbutton switch
D. squeeze capacitor C1

C (circled)

#6 The loudness of the emitted tone _____ .

A. is controlled by S1
B. is adjustable by the value of R1
C. is adjustable by the value of C1
D. is fixed

D (circled)

#7 Resistors R1, R2 and R5 _____ .

A. are not connected
B. control the loudness of the speaker
C. are not important in the circuit
D. are connected

D (circled)

#8 When this circuit is working correctly, as soon as you _____ it will emit a tone.

A. press the switch S1
B. connect the battery
C. remove the 555 Timer IC
D. install capacitor C1

B (circled)

#9 Pressing Switch S1 puts _____ in parallel.

A. R1 and R2
B. R2 and R3
C. R5 and R2
D. R4 and R5

C (circled)

#10 In order to shut off this circuit, you must _____.

A. disconnect the battery
B. hold down the pushbutton switch
C. hold your ears
D. change capacitor C1 to a different value

A (circled)

(Form SQAK27)

QUICK-CHECK ANSWER KEY for Experiment 28 QUIZ
for Mr Circuit Electronics Training ("Electronic Canary")

Place this sheet over top of the STUDENT QUIZ (offset a little to the left and then offset to the right) to compare the answers on this sheet to the answers that the student marked. Put an 'X' for each wrong answer.

Count the right answers and record the score of right answers in your grade book.

A B **C** D

#1 This circuit uses a 555 Timer IC and _____ .

A. an SCR
B. a variable capacitor
C. a two-transistor oscillator
D. a Photocell

A **B** C D

#2 R1 is connected to _____ .

A. R3
B. R7
C. C1
D. R2

A B **C** D

#3 On the 555 Timer _____ .

A. all but pin 5 are used
B. all but pin 4 are useds
C. all 8 pins are used
D. only 6 pins are used

A **B** C D

#4 The purpose of this circuit is to _____ .

A. emit a siren sound
B. emit bird chirps
C. sense heat
D. sense light

A **B** C D

#5 How do you make the circuit emit different tones?

A. connect and disconnect the battery
B. adjust R7 and press the pushbutton
C. vary the heat in the room
D. feed it birdseed

#6 The output of the two-transistor oscillator is fed into _____ of the 555 Timer IC .

A. Pin 5
B. Pin 6
C. Pin 7
D. Pin 8

A B C D

#7 Switch S1 is connected to _____ .

A. Pin 4
B. Pin 1
C. Pin 3
D. Pin 6

A **B** C D

#8 One side of the speaker is connected directly to _____ .

A. the Base of Q1
B. the Emitter of Q2
C. Pin 2 on the 555 Timer IC
D. the positive of the battery

A B C **D**

#9 C4 and R6 are connected in parallel to the speaker and _____ of the 555 Timer IC.

A. Pin 3
B. Pin 4
C. Pin 5
D. Pin 8

A B C D

#10 Capacitor C1 is part of _____ .

A. the two-transistor oscillator circuit
B. the voltage regulator circuit
C. the power supply circuit
D. output circuit

(Form SQAK28)

QUICK-CHECK ANSWER KEY for Experiment 29 QUIZ
for Mr Circuit Electronics Training ("fantasy Space Machine Gun")

Place this sheet over top of the STUDENT QUIZ (offset a little to the left and then offset to the right) to compare the answers on this sheet to the answers that the student marked. Put an 'X' for each wrong answer.

Count the right answers and record the score of right answers in your grade book.

A B C (D)

#1 This circuit uses a 555 Timer IC and _____ .

A. an SCR
B. a variable capacitor
C. a Photocell
D. a two-transistor oscillator

(A) B C D

#2 R4 is connected to _____ .

A. Pin 7
B. R7
C. C1
D. R2

A B C (D)

#3 On the 555 Timer _____ .

A. all 8 pins are used
B. all but pin 4 are useds
C. all but pin 5 are used
D. only 6 pins are used

A B (C) D

#4 The purpose of this circuit is to _____ .

A. emit a siren sound
B. emit bird chirps
C. emit phasor machine gun sounds
D. emit crunching sounds

A (B) C D

#5 In addition to fantasy machine gun sounds what else does the circuit do?

A. vibrates like a snake
B. chirps like a bird
C. varies the heat in the room
D. emits a light effect with an LED

(A) B C D

#6 The Collector of transistor Q2 is connected to _____ of the 555 Timer IC.

A. Pin 5
B. Pin 6
C. Pin 7
D. Pin 8

A B C D

#7 Switch S1 is connected to _____ .

A. the positive of the battery
B. resistor R6
C. the Base of transistor Q2
D. the negative of the battery

A B C (D)

#8 One side of the speaker is connected directly to _____ .

A. an LED
B. Pin 3 on the 555 Timer IC
C. Pin 7 on the 555 Timer IC
D. the positive of the battery

(A) B C D

#9 The Anode of the LED is connected directly to _____ .

A. Pin 3
B. the positive of the battery
C. the negative of the battery
D. Pin 7

A (B) C D

#10 Resistor R5 is connected across _____ .

A. pins 6 and 7 of the 555 Timer IC
B. the speaker
C. the power supply circuit
D. output circuit

(A) B C D

(Form SQAK29)

QUICK-CHECK ANSWER KEY for Experiment 30 QUIZ
for Mr Circuit Electronics Training ("Ultrasonic Pest Repeller")

Place this sheet over top of the STUDENT QUIZ (offset a little to the left and then offset to the right) to compare the answers on this sheet to the answers that the student marked. Put an 'X' for each wrong answer.

Count the right answers and record the score of right answers in your grade book.

A
B
C
D

#1 This circuit uses a 555 Timer IC and _____ .

A. a two-transistor oscillator
B. a variable capacitor
C. a Photocell
D. an SCR

A
B
C
D

#2 R6 is connected to _____ .

A. Pin 7
B. R7
C. C1
D. Pin 3

A
B
C
D

#3 On the 555 Timer _____ .

A. all but pin 4 are used
B. all 8 pins are used
C. all but pin 5 are used
D. only 6 pins are used

A
B
C
D

#4 The purpose of this circuit is to _____ .

A. emit a siren sound
B. emit ultrasonic sounds
C. emit phasor machine gun sounds
D. emit crunching sounds

A
B
C
D

#5 What are the signals from this circuit supposed to do?

A. repel pests
B. chirp like a birds
C. varies the heat in the room
D. vibrate like a snake

#6 The frequencies that may repel pests are from 13.5 thousand cycles per second to _____ .

A. 1 Megacycle (1Mhz)
B. 80 thousand cycles per second (80kHz)
C. 25 Giga Hz
D. 10 milli Hz

A
B
C
D

#7 How can you tell if the circuit is working?

A. you can feel the speaker vibrate
B. resistor R6 will be smoking
C. the LED will light up
D. the battery will be hot

A
B
C
D

#8 One side of the speaker is connected directly to _____ .

A. the positive of the battery
B. Pin 3 on the 555 Timer IC
C. Pin 7 on the 555 Timer IC
D. an LED

A
B
C
D

#9 C1 is 10uF and it is part of the _____ .

A. two-transistor oscillator
B. power supply circuit
C. output circuit
D. heat sensing circit

A
B
C
D

#10 What capacitor is connected to R3 and R4?

A. C1
B. C2
C. C3
D. Q2

(Form SQAK30)