Chapter 3

3.1 Which statement applies to LEDs?

A. They can be used with very high currents.

B. They have a turn-on threshold of about 5V that must be exceeded before current can flow.

C. They block the flow of electricity in one direction.

D. They appear brightest when viewed from the side.

3.2 Placing resistors in _____ increases the total resistance while placing them in _____ decreases total resistance.

A. parallel; series

B. series; ohm

C. watt; kirchhoff

D. series; parallel

3.3 Which of these is Ohm's Law?

A. Current equals Power divided by Resistance.

B. Current equals Voltage divided by Resistance.

C. Voltage equals Current divided by Resistance.

D. All current flowing into a point must flow out of it.

3.4 Kirchhoff's Laws are . . .

A. a basic set of rules for analyzing circuits.

B. variations of Ohm's Law.

C. a method of calculating the total resistance of resistors in series and in parallel.

D. a method of marking resistors with colored bands for easy identification.

3.5 Electrical power is . . .

A. calculated by multiplying the voltage and current together.

B. a measure of how much energy is moving through a wire.

C. expressed in Watts.

D. All of the above.

3.6 Which of these statements about resistors is wrong?

A. Resistors get warm because they convert electrical energy into heat.

B. They are made from materials like tin and lead.

C. Resistance is friction between an electric current and the material it is moving through.

D. Resistors control and limit the flow of electricity.

3.7 Copper is a good _____ while paper is a good _____.

A. resistor; conductor

B. insulator; conductor

C. conductor; insulator

D. semiconductor; insulator

3.8 Nearly all electricity eventually becomes . . .

A. heat.

B. information.

C. garbage.

D. chemical energy.

3.9 Which has the least resistance?

A. Air.

B. Distilled water.

C. Salt water.

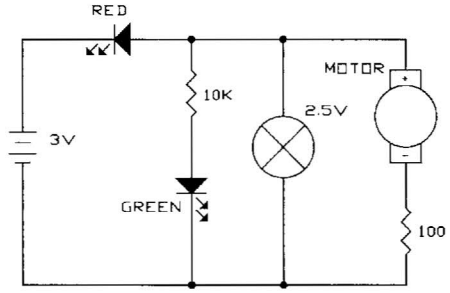
D. Drinking water.

3.10 Draw the schematic for a circuit using a battery set, an LED, and two 1KΩ resistors. The total resistance in the circuit must be less than 1KΩ, and the LED must light.

3.11 Draw the schematic for a circuit using a battery set, an LED, and three 1KΩ resistors. The total resistance in the circuit must be greater than 2KΩ, and the LED must light.

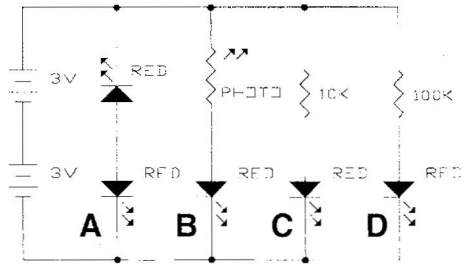
3.12 Draw the schematic for a circuit using a battery set, an LED, a slide switch, a 100Ω resistor, and a 1KΩ resistor. The LED must always light and must never have less than 100Ω in series with it. The slide switch should used to adjust the LED brightness, brighter if the switch is on.

3.13 What will this circuit do?



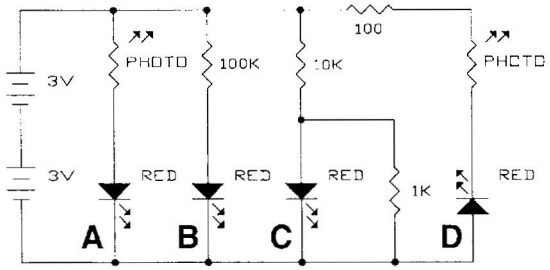
A. Light the LED.
B. Light the lamp.
C. Spin the motor.
D. Nothing.

3.14 Which LED will be brightest in a dark room?



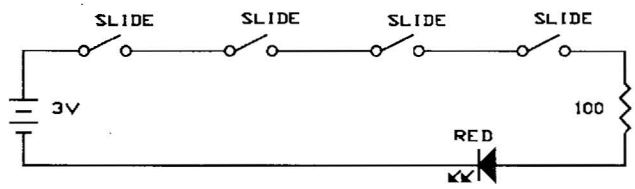
A. LED A
B. LED B
C. LED C
D. LED D

3.15 In a bright room which LED will be brightest?



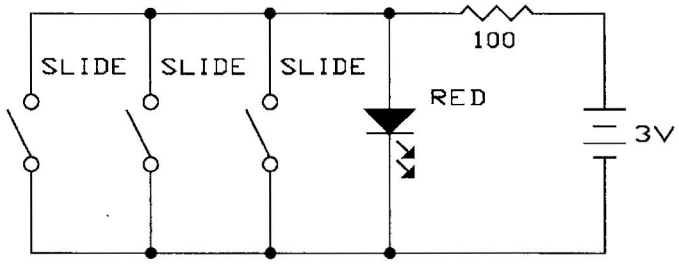
A. LED A
B. LED B
C. LED C
D. LED D

3.16 What type of logic circuit is this?



A. OR
B. AND
C. NAND
D. NOR

3.17 What type of logic circuit is this?



A. OR
B. AND
C. NAND
D. NOR

3.18 Digital electronics . . .

A. uses computers to process electronic information.
B. uses a series of numbers to represent an electronic signal.
C. always gives better performance at lower cost.
D. always has a display with at least one digit.

3.19 The accuracy of a digital representation of a signal depends on . . .

A. the speed of the microprocessor in the computer.
B. the voltages used in the measurement.
C. how accurately and how often the original signal was measured.
D. the complexity of the circuit.

3.20 Which of these is the name of a circuit that is a basic building block in computers, made up of transistors?

A. NEVER
B. ALWAYS
C. SOMETIMES
D. AND