Courseware covered by Mand Labs KIT-1

Basics of Electrical and Electricity, Charge, Battery, Voltage, Current, Resistance, Ohm's Law, Series and Parallel Combination, Variable Resistors (Potentiometer, Preset and LDR), Switches, Capacitors, Relay, Introduction to semiconductors, Diode and its types, Digital Logic Gates, Zener diode, DC Motor, Transistors, Sensors- Temperature (NTC thermistor), IR (Infrared), Inductors, Lenz's Law, Principle of EMI.

List of Experiments in KIT-1 Standard Edition

1. Measuring voltage using a multimeter.
2. Measuring resistance using a multimeter.
3. Continuity test of an LED.
4. Glowing an LED and verifying Kirchhoff's Voltage Law (KVL).
5. Measuring current in a circuit using a multimeter and verifying Ohm's law.
6. Glowing an LED using a potentiometer.
7. Varying intensity of light using a preset.
8. Alternate glowing of LEDs using a preset.
9. Glowing an LED using an LDR.
10. Beeping a buzzer.
11. Series combination of LEDs and verifying Kirchhoff's Voltage Law and Ohm's Law.
12. Parallel combination of LEDs-Type 1.
13. Parallel combination of LEDs-Type 2 and verifying Kirchhoff's Current Law (KCL).
14. Continuity test of an SPDT switch.
15. Controlling an LED using an SPDT switch.
16. Alternate switching of LEDs using an SPDT switch.
17. Staircase lighting.
18. Charging and discharging of a capacitor.
19. Charging different capacitors with resistors and Time constant calculation during charging.
20. Discharging different capacitors with resistors and Time constant calculation during discharging.
21. Sequential Glow of LEDs.
22. Continuity test of a relay using a multimeter.
23. Burglar Alarm: Type 1 and Type 2.

24. Continuity test of Bump switch and Momentary push button switch.

List of Experiments in KIT-1 Standard Edition

25. Relay as an oscillator.
26. Surgery of a DC motor.
27. DC motor as a generator.
28. Controlling speed of DC motor.
29. Diode as a switch, Its functioning in forward bias and reverse bias modes.
30. Current following a minimum resistance path through the diode, when it is forward biased.
31. Protecting a circuit using a diode.
32. OR Gate using diodes.
33. AND Gate using diodes.
34. NOR Gate using diodes.
35. NAND Gate using diodes.
36. To learn how a Zener diode works.
37. Zener diode as a voltage regulator.
38. Identifying the type of BJT transistor using a multimeter.
39. Measuring the gain of a transistor.
40. B-E junction as diode in a transistor.
41. Transistor as an Amplifier and a Switch. Demonstrating cut-off, active and saturation region of a transistor. Identifying the biasing conditions for all the three regions of a transistor. Experimental calculation of beta in active and saturation region.
42. Touch activated switch using a transistor and verifying the biasing conditions of 'transistor in saturation region'.
43. Darlington pair and cascading transistors for multistage amplification.
44. Transistor as Touch Activated Switch.
45. Automatic night lamp.
46. Inverted night lamp.
47. OR Gate using transistors.
48. AND Gate using transistors.
49. NOR Gate using transistors.
50. NAND Gate using transistors.
51. Transistor as an Inverter (NOT Gate).
52. LED Flasher using transistor and concept of Tunneling (Esaki diode).
53. Alternating blinking of LEDs using transistors.
54. H-Bridge (Motor Driving Circuit).

Additional Activities in KIT-1 Standard:

1. Tasting a 9V battery.
2. Making Lemon battery at home.
3. Preset/potentiometer as a voltage divider.
4. Motor control using two DPDT switches.
5. Half-wave and Full-wave rectification.

Premium Projects in KIT-1 Premium Edition:

1. IR (Infrared) Security Alarm System
2. Joule Thief (Drawing energy from a dead cell)
3. Temperature Sensor

For any queries, write to us at support@mandlabs.com

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