SHREE RAKSHA BN **BU21EECE0100552**

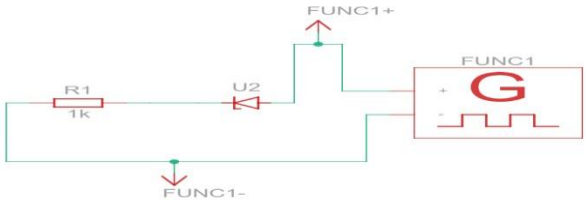
REPORT ON PCB WORKSHOP

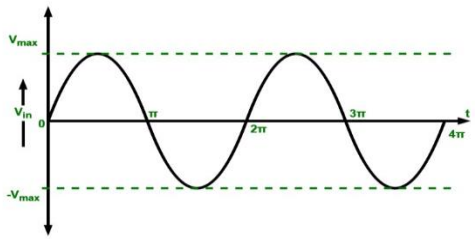
1. PROTOTYPE TYPE: ANALOG CIRCUIT – HALF WAVE RECTIFIER

2. Simulation Results: Components required –

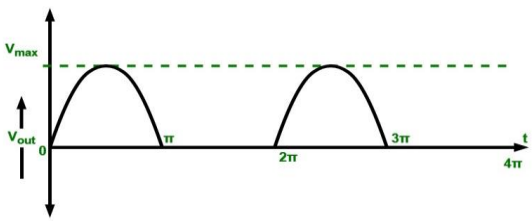
Materials Required	Specifications	Qty
Bread board	-	1
CRO	20/30Mhz	1
Diodes	IN4007	1
Resistors	1K	1
Transformer	9-0-9	1
Connecting wires	-	Lumsum
Probe	-	2

Connect diode on breadboard through a Transformer. Transformer has three wires 9-0-9 where 9&9 are positive and 0 is ground since half wave rectifier we are using one diode we need only one positive terminal and it is connected to anode part of the diode and 0 is connected to ground. Connect resistor 1k on breadboard it is used as load resistor and connected from cathode terminal to the ground. Connect CRO of input output channel using probes.





Full Wave



Half Wave

key aspects of the simulation

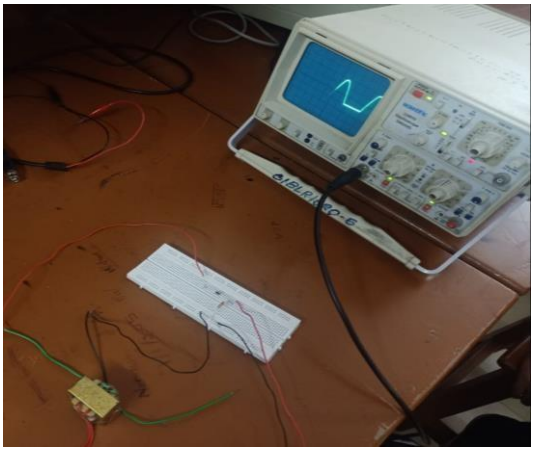
Such as input/output wave forms:- CRO is having two channels channel one used for input signal and channel two for output signal after connection the result waveform will be displayed as full waveform then it is converted into halfwave because diode will conduct only in 1 direction output of positive terminal of the probe will be connected cathode part of the diode & negative connected to ground we will be using channel to as output.

Here output will be rectified one during positive half cycle diode conducts during negative half cycle diode will be off. Output will be only for positive half cycle.

3. Hardware Results:

a. present hardware implementation of the prototype on bread-board.

- Include measurements, observations:



4. Comparison of Simulation and Hardware Results

Simulation results: Use software like Multisim or MATLAB

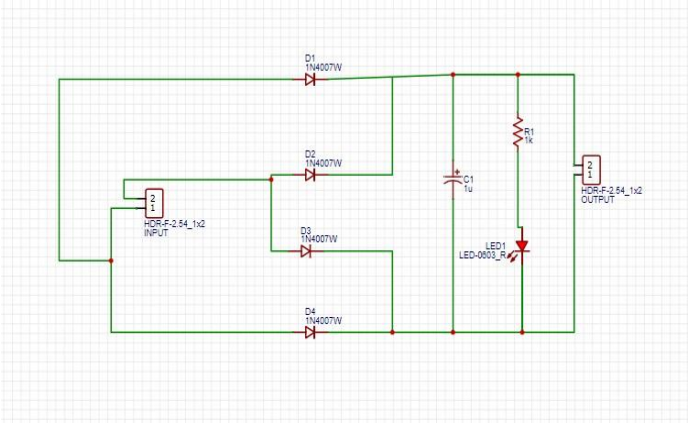
Here are some of observations from a simulation of half wave rectifier

- Waveform shape
- Peak voltage
- DC Component
- Load effects

Hardware results: Hardware implementations involve constructing the circuit on a breadboard or PCB. Hardware implementations reveal additional complexities and imperfections. Some possible reasons for variations are:-

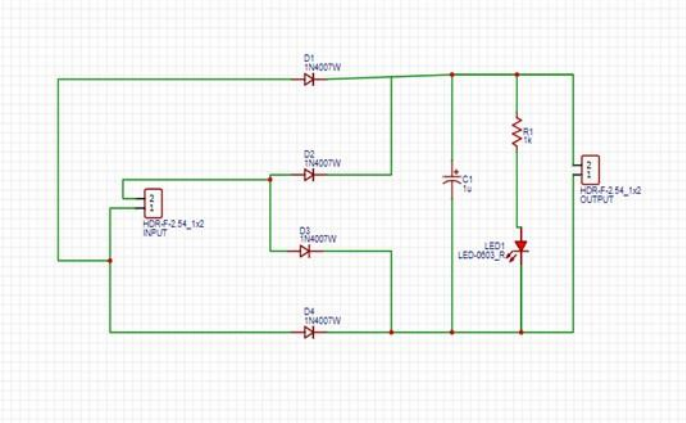
1. Component tolerances and Non-Idealities
2. Power supply variations
3. Thermal effects
4. Measurement inaccuracies
5. Imperfect modelling
6. Load effects

5. Design Finalization :

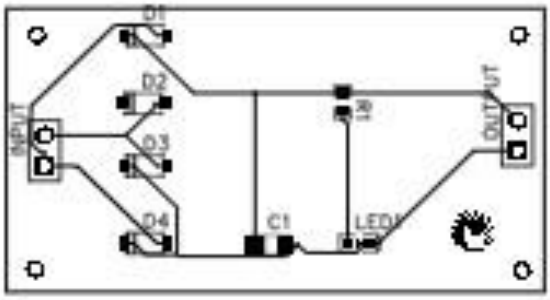


6. Circuit building on Easy EDA tools

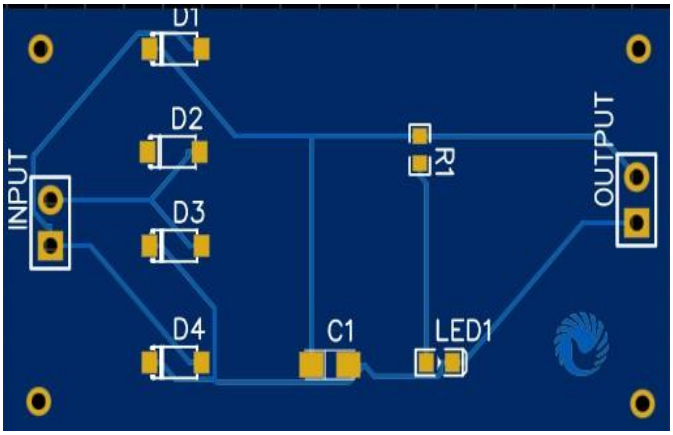
- In Easy EDA Software draw the circuit accordingly



- Then save the circuit and convert schematic to PCB
- Then arrange the components and auto route so that it will arrange accordingly



- Change PCB to any 2D and 3D model view



7. PCB Designing on Easy EDA Tools:

i. After designing the circuit convert that schematic to PCB
ii. Then place the components and click on route and press auto route so that the components will be arranged accordingly
iii. Then layout can be changed to 2D and 3d model to view the final design

- Components can be placed with the minimal space inside the layout after that place all the components
- After placing click the track and connect the components
- Holes can be inserted at the corners
- Auto route for better PCB Design

8. Verification of the final design: DRC check is performed after routing.

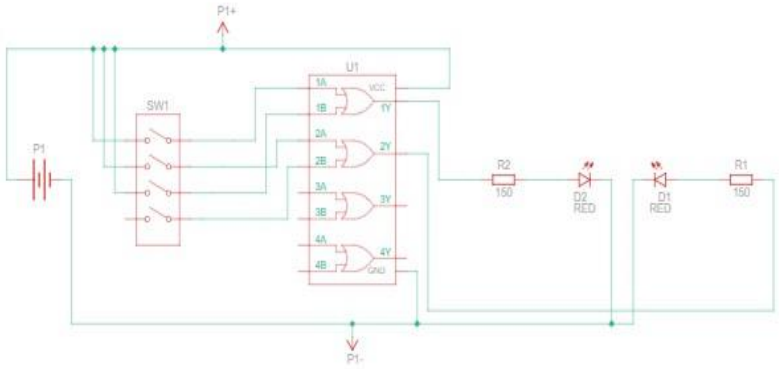
1. PROTOTYPE TYPE: DIGITAL CIRCUIT 4*2 ENCODER

2. Simulation Results:

Components required : IC 7432 OR Gate, Led, connecting wires, DLD Kit, 1K Resistor.

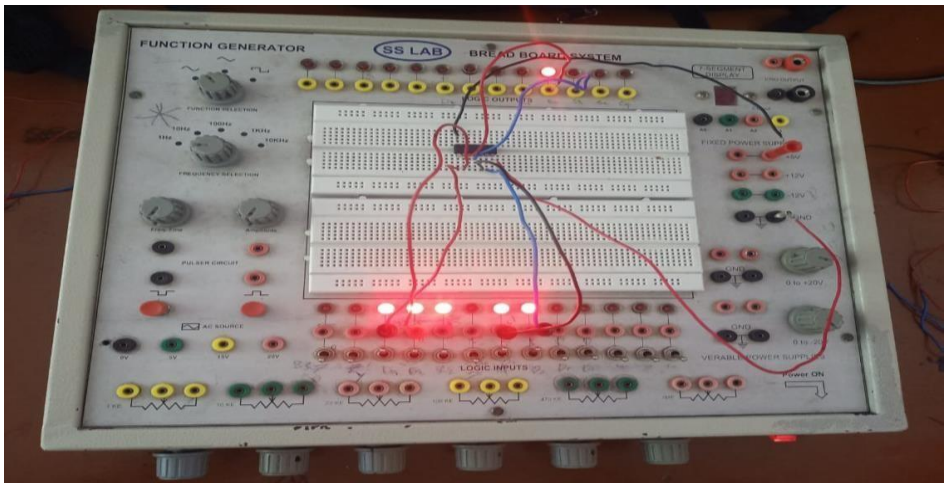
Process: Connect the components on breadboard according to the logic design and truth table then connect the pins on kit to the breadboard accordingly and switch on the kit vary the values according to the truth table and led starts glowing.

CIRCUITS



In a digital IC Trainer kit connect the LED, Resistor, IC 7432 OR Gate pin, through connecting wires according to the circuit diagram and give the input pins connecting them to the output pins, and then switch on the kit LED starts glowing.

3. Hardware Results:

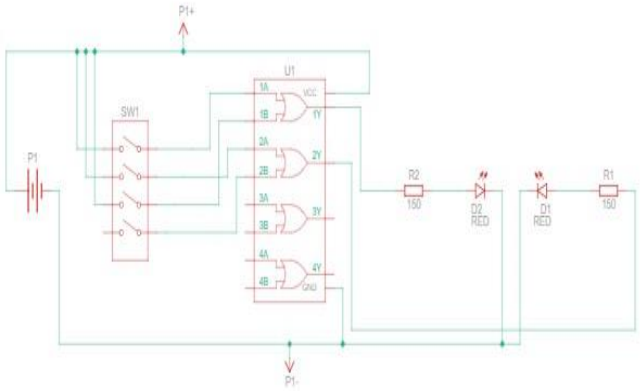


4. Comparison of Simulation and Hardware Results

Simulation results: LED Starts glowing so that we can observe the simulation representation in the form of light

Hardware results: Hardware implementations involve constructing the circuit on a breadboard on the digital IC Kit. Hardware implementations reveal additional complexities and imperfections.

5. Design Finalization:



6. Circuit building on Easy EDA tools

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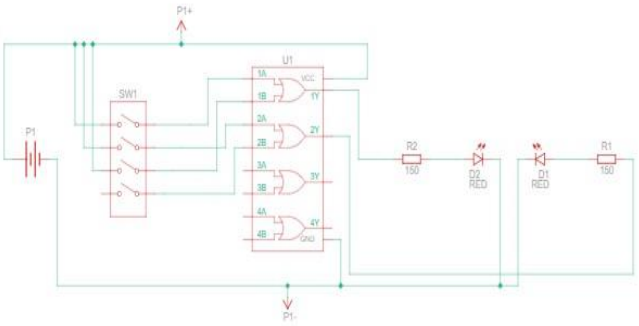

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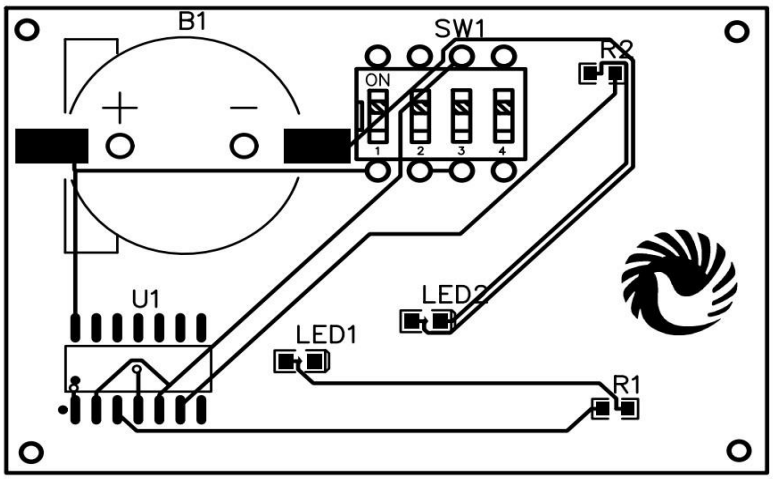
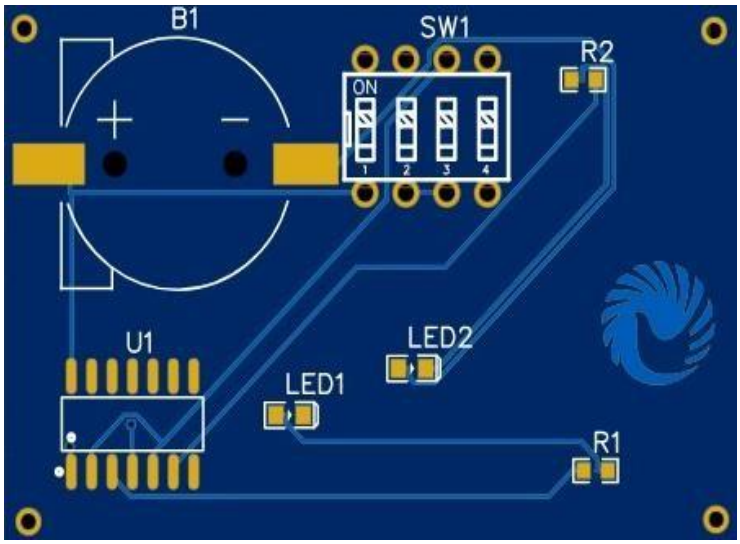


- Change PCB to any 2D and 3D model view



7. PCB Designing on Easy EDA Tools:

1. After designing the circuit convert that schematic to PCB
2. Then place the components and click on route and press auto route so that the components will be arranged accordingly
3. Then layout can be changed to 2D and 3d model to view the final design.
   PCB layout for manufacturability and performance.
   - Components can be placed with the minimal space inside the layout after that place all the components
   - After placing click the track and connect the components
   - Holes can be inserted at the corners
   - Auto route for better PCB Design

8. Verification of the final design : DRC check is performed after routing.