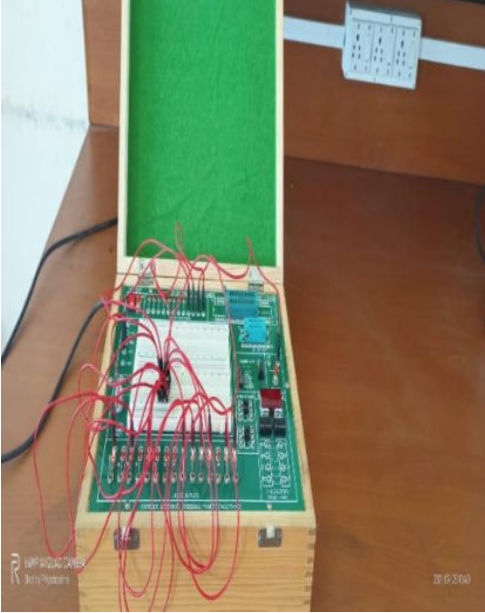


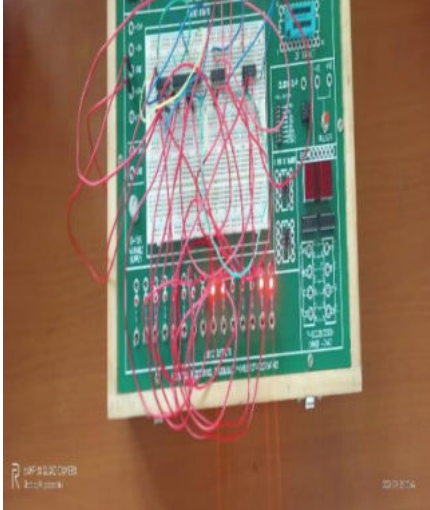


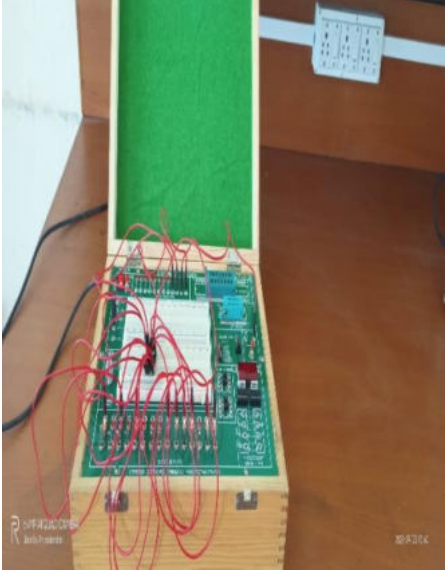
**SRI PADMAVATI MAHILA VISVAVIDYALAYAM
(WOMEN'S UNIVERSITY) TIRUPATI-517502.
SCHOOL OF ENGINEERING AND TECHNOLOGY
DEPARTMENT OF ELECTRONICS AND COMMUNICATION
ENGINEERING
DIGITAL SYSTEM DESIGN LABORATORY**

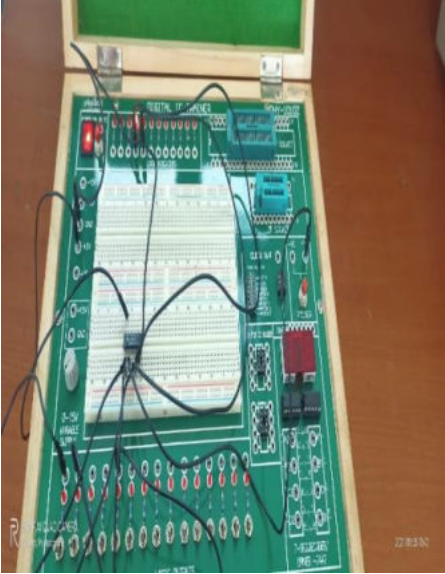
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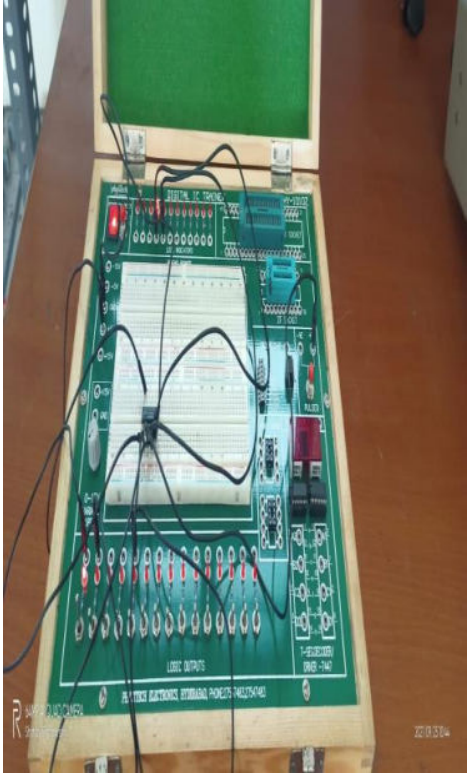
Dated: 05-11-2021

S.NO	NAME OF THE EXPERIMENT	SPECIFICATIONS AND EQUIPMENT DETAILS	EQUIPMENT PHOTO WITH CONNECTIONS
1.	Testing of Logic gates and simulation of gates using universal gates	<p>1.DIGITAL IC TRAINER KIT</p> <ul style="list-style-type: none"> • 7 segment LED display (2 nos.) • Logic input switches (10 nos.) • Logic status indicators (10 nos.) • Bounce less Pulsar 1 Hz to 100 KHz TTL clocks. • Bread Board - 2 Nos. • Power LED Indication. • Built in Regulated Power Supply: 5V/1A ,12V/1A DC • AC Input : 230V AC, 50 Hz, Mounted on a Sophisticated Cabinet. 	
		<p>IC 7400</p> <p>Quad two-input NAND-gate</p> <ul style="list-style-type: none"> • The voltage supply is 5 V • Propagation delay for each gate will be 10 ns • Maximum toggle speed is 25 MHz • Power utilization for each gate is 10 mW 	

		<p>IC 7402</p> <p>Quad two-input NOR-gate</p> <ul style="list-style-type: none"> • Four Independent 2-Input NOR Gates • Outputs Directly Interface to CMOS, NMOS and TTL • Large Operating Voltage Range • Wide Operating Conditions 	
		<p>IC 7408</p> <p>Quad two-input AND-gate</p> <ul style="list-style-type: none"> • Operating voltage range: +4.75 to +5.25V. • Recommended operating voltage: +5V. • Maximum supply voltage: 7V. • Maximum current allowed to draw through each gate output: 8mA. TTL outputs. 	
		<p>IC 7404</p> <p>NOT GATE</p> <ul style="list-style-type: none"> • Supply voltage range: +4.75V to +5.25V. • Maximum supply voltage: +7V. • Maximum current allowed to draw through each gate output: 8mA. • Totally lead-free. • Maximum Rise Time: 15ns. • Maximum Fall Time: 15ns. 	

		<p>IC 7432</p> <p>Quad two-input OR-gates</p> <ul style="list-style-type: none"> • Dual Input OR Gate – Quad Package. • Supply Voltage: 5 to 7V. • Input Voltage: 5 to 7V. • Operating temperature range -55°C to 125°C. • Available in 14-pin SOIC package. 	
		<p>IC 7486</p> <p>Quad two-input XOR-gate</p> <ul style="list-style-type: none"> • Input Voltage 5.5V Operating Free Air Temperature 0°C to +70°C Storage Temperature Range -65°C to +150°C 	
2	Decoders	<p>1.DIGITAL IC TRAINER KIT</p> <ul style="list-style-type: none"> • 7 segment LED display (2 nos.) • Logic input switches (10 nos.) • Logic status indicators (10 nos.) • Bounce less Pulsar 1 Hz to 100 KHz TTL clocks. • Bread Board - 2 Nos. • Power LED Indication. • Built in Regulated Power Supply: 5V/1A ,12V/1A DC <p>AC Input : 230V AC, 50 Hz, Mounted on a Sophisticated Cabinet.</p> <p>2.IC74138</p> <ul style="list-style-type: none"> • IC 74138 is a Logical Decoder IC. It also has a demultiplexing facility. The IC 74138 is available in the market with the name of 	

		<p>74LS138. It is a 3 to 8 decoder IC. The internal circuit of this IC is made of high-speed Schottky barrier diode.</p>	
3	Multiplexer	<p>1.DIGITAL IC TRAINER KIT</p> <ul style="list-style-type: none"> • 7 segment LED display (2 nos.) • Logic input switches (10 nos.) • Logic status indicators (10 nos.) • Bounce less Pulsar 1 Hz to 100 KHz TTL clocks. • Bread Board - 2 Nos. • Power LED Indication. • Built in Regulated Power Supply: 5V/1A ,12V/1A DC <p>AC Input : 230V AC, 50 Hz, Mounted on a Sophisticated Cabinet.</p> <p>2.74153 is a data multiplexer or data selector IC. It has inverters and drivers that supply fully complementary data selection to the AND-OR-NOT gates.</p>	

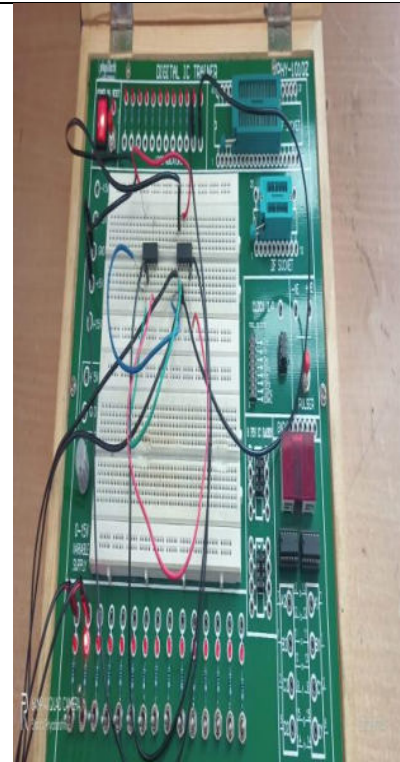
5	De multiplexer	<p>1.DIGITAL IC TRAINER KIT</p> <ul style="list-style-type: none"> • 7 segment LED display (2 nos.) • Logic input switches (10 nos.) • Logic status indicators (10 nos.) • Bounce less Pulsar 1 Hz to 100 KHz TTL clocks. • Bread Board - 2 Nos. • Power LED Indication. • Built in Regulated Power Supply: 5V/1A ,12V/1A DC <p>AC Input : 230V AC, 50 Hz, Mounted on a Sophisticated Cabinet.</p> <p>2.IC 74155 is a dual 1:4 line demultiplexer with individual strobe inputs. It has common binary address inputs (A, B and C) and it is available in single 16 pin package.The data applied to input IC is inverted at its output and that applied at pin number 15 is not inverted through the output.</p>	
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6

Flip-flops

1.DIGITAL IC TRAINER KIT

- 7 segment LED display (2 nos.)
- Logic input switches (10 nos.)
- Logic status indicators (10 nos.)
- Bounce less Pulsar 1 Hz to 100 KHz TTL clocks.
- Bread Board - 2 Nos.
- Power LED Indication.
- Built in Regulated Power Supply: 5V/1A ,12V/1A DC
- AC Input : 230V AC, 50 Hz,
- Mounted on a Sophisticated Cabinet.



D-flipflop:

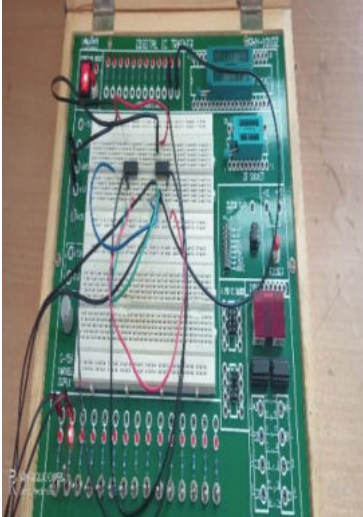
2.IC 7474

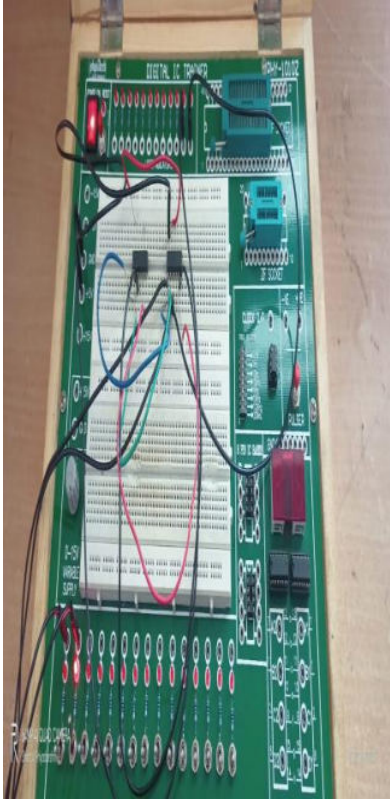
Here, the given circuit demonstrates the operation of D flip-flop. The flip-flop is built using four 2 input NAND gates, one NOT gate and clock pulse generator is built using multi vibrator chip IC NE555. SPDT switch is used to give D input as logic 1 (high – 5 V) and logic 0 (low – 0 V).


JK-flipflop:

The 74LS73 is a dual in-line JK flip flop IC. Meaning it has two JK flip flops inside it and each can be

		<p>used individually based on our application. J-K input is loaded into the master while the clock is high and transferred to the slave on the high to low transition.</p>	
8	Shift Register	<ul style="list-style-type: none"> • DIGITAL IC TRAINER KIT • 7 segment LED display (2 nos.) • Logic input switches (10 nos.) • Logic status indicators (10 nos.) • Bounce less Pulsar 1 Hz to 100 KHz TTL clocks. • Bread Board - 2 Nos. • Power LED Indication. • Built in Regulated Power Supply: 5V/1A ,12V/1A DC • AC Input : 230V AC, 50 Hz, • Mounted on a Sophisticated Cabinet. <p>2.SN74HC595N is a simple 8-bit shift register IC. Simply put, this shift register is a device that allows additional inputs or outputs to be added to a microcontroller by converting data between parallel and serial formats.</p> <p>A shift register is a type of digital circuit using a cascade of flip flops where the output of one flip-flop is connected to the input of the next. They share a single clock signal, which causes the data stored in the system to shift from one location to the next.</p>	

10	Half Adder and Full Adder	<p>.DIGITAL IC TRAINER KIT</p> <ul style="list-style-type: none"> • 7 segment LED display (2 nos.) • Logic input switches (10 nos.) • Logic status indicators (10 nos.) • Bounce less Pulsar 1 Hz to 100 KHz TTL clocks. • Bread Board - 2 Nos. • Power LED Indication. • Built in Regulated Power Supply: 5V/1A ,12V/1A DC <p>AC Input : 230V AC, 50 Hz, Mounted on a Sophisticated Cabinet</p> <p>The half adder accepts two binary digits on its inputs and produce two binary digits outputs, a sum bit and a carry bit. The half adder is an example of a simple, functional digital circuit built from two logic gates. The half adder adds to one-bit binary numbers (AB). The output is the sum of the two bits (S) and the carry (C).</p> <p>The full adder accepts two inputs bits and an input carry and generates a sum output and an output carry. The full-adder circuit adds three one-bit binary numbers (Cin, A ,B) and outputs two one-bit binary numbers, a sum (S) and a carry (Cout). The full-adder is usually a component in a cascade of adders, which add 8, 16, 32, etc. binary numbers.</p>	

11	Half subtractor Full Subtractor	<p>1.DIGITAL IC TRAINER KIT</p> <ul style="list-style-type: none"> • 7 segment LED display (2 nos.) • Logic input switches (10 nos.) • Logic status indicators (10 nos.) • Bounce less Pulsar 1 Hz to 100 KHz TTL clocks. • Bread Board - 2 Nos. • Power LED Indication. • Built in Regulated Power Supply: 5V/1A ,12V/1A DC • AC Input : 230V AC, 50 Hz, Mounted on a Sophisticated Cabinet. <p>2.The half subtractor is a combinational circuit which is used to perform subtraction of two bits. It has two inputs, the minuend and subtrahend and two outputs the difference and borrow out . The borrow out signal is set when the subtractor needs to borrow from the next digit in a multi-digit subtraction</p> <p>3.A full subtractor is a combinational circuit that performs subtraction of two bits, one is minuend and other is subtrahend, taking into account borrow of the previous adjacent lower minuend bit. ... The three inputs A, B and Bin, denote the minuend, subtrahend, and previous borrow, respectively</p>	
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12	Seven Segment Decoder and display	<p>1.DIGITAL IC TRAINER KIT</p> <ul style="list-style-type: none"> • 7 segment LED display (2 nos.) • Logic input switches (10 nos.) • Logic status indicators (10 nos.) • Bounce less Pulsar 1 Hz to 100 KHz TTL clocks. • Bread Board - 2 Nos. • Power LED Indication. • Built in Regulated Power Supply: 5V/1A ,12V/1A DC • AC Input : 230V AC, 50 Hz, • Mounted on a Sophisticated Cabinet. <p>2.Digital Decoder IC, is a device which converts one digital format into another and one of the most commonly used devices for doing this is called the Binary Coded Decimal (BCD) to 7-Segment Display Decoder.</p> <p>7-segment LED (Light Emitting Diode) or LCD (Liquid Crystal Display) type displays, provide a very convenient way of displaying information or digital data in the form of numbers, letters or even alpha-numerical characters.</p> <p>Typically 7-segment displays consist of seven individual coloured LED's (called the segments), within one single display package. In order to produce the required numbers or HEX characters from 0 to 9 and A to F respectively, on the display the correct combination of LED segments need to be illuminated and BCD to</p>	
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		7-segment Display Decoders such as the 74LS47 do just that.	
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