Global Academy of Technology

Department Of Electronics and Communication Engineering

Report On

DIGITAL ELECTRONICS

III Semester
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TITLE: MOD100 COUNTER AKA STOPWATCH

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Acknowledgement:

We Gowrav S, Gokul Sai R and Amogh R are thankful to you Kavya ma’am for giving us an opportunity to showcase our project on Digital Electronics i.e. to demonstrate MOD100 counter using digital gates and understand the concept to its full extent.
Thank you, Ma’am.

AIM:

To design and construct a MOD100 Counter and simulate the same in Multisim Simulation Software.

COMPONENTS REQUIRED:

COMPONENTS	SPECIFICATIONS	QUANTITY
1. Led bulbs	-	8 Nos.
2. IC 7490	5V	2 Nos.
3. IC 7447	5V	2 Nos.
4. 7 Segment display	Common anode	2 Nos.

EQIUPMENTS REQUIRED:

Bread board, mono-core wire, digital trainer kit.

PROCEDURE:

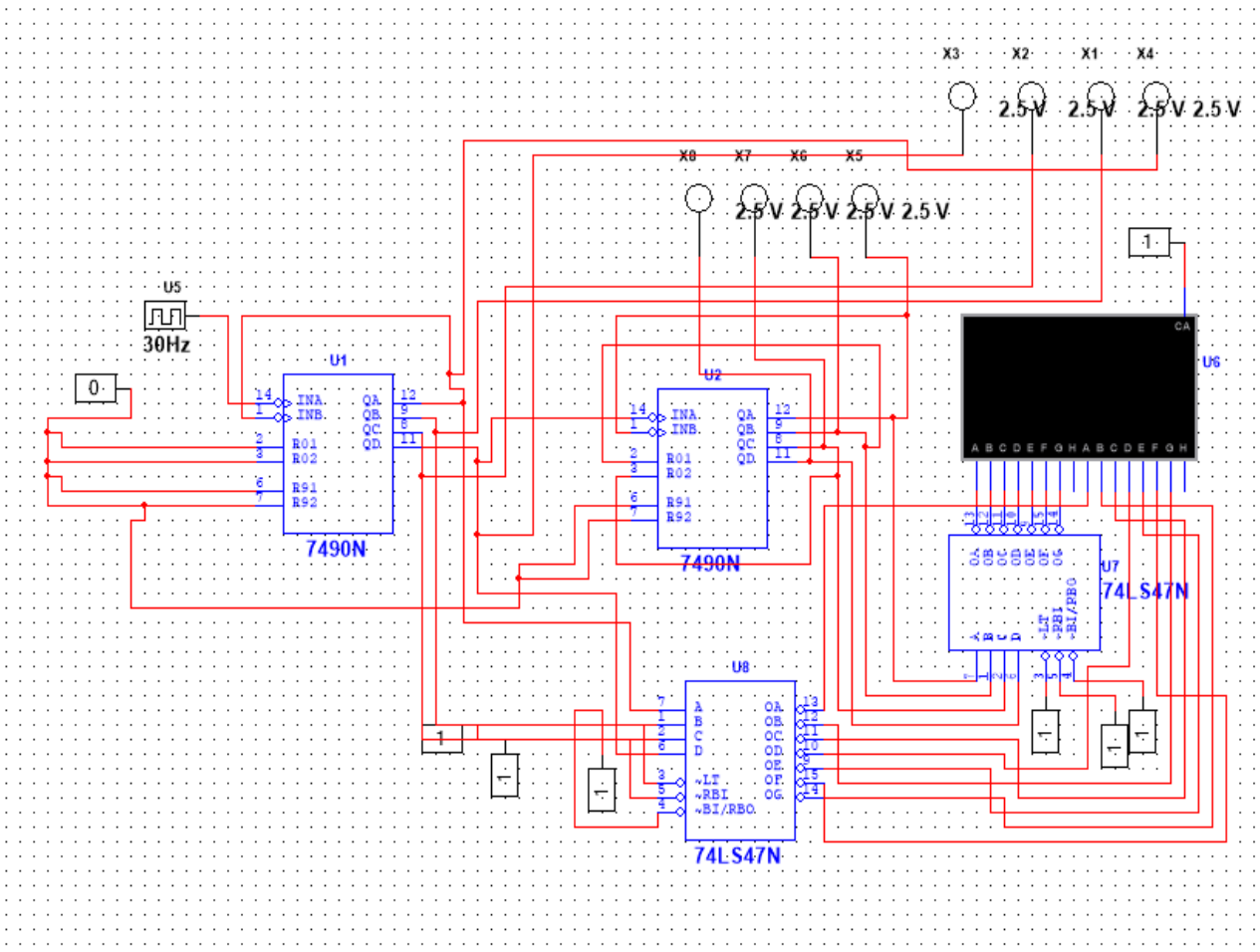
- 1st construct a MOD 100 counter, which is constructed by using two mod 10 counter i.e., by cascading the last bit of output of the 1st mod 10 counter to the 1st bit input of 2nd mod10 counter.
- The output of this counter is connected to the driver IC or the decoder circuit individually as the output of the counter is binary, this driver or the decoder circuit converts binary to seven segment display inputs which shows number in the form of decimal.
- The outputs of these decoder IC are connected to the respective segments of the seven-segment display.
- In order to produce a time delay of 1 sec a function generator producing square wave of 1Hz frequency is connected as clock pulse to the counter.

Working Principle:

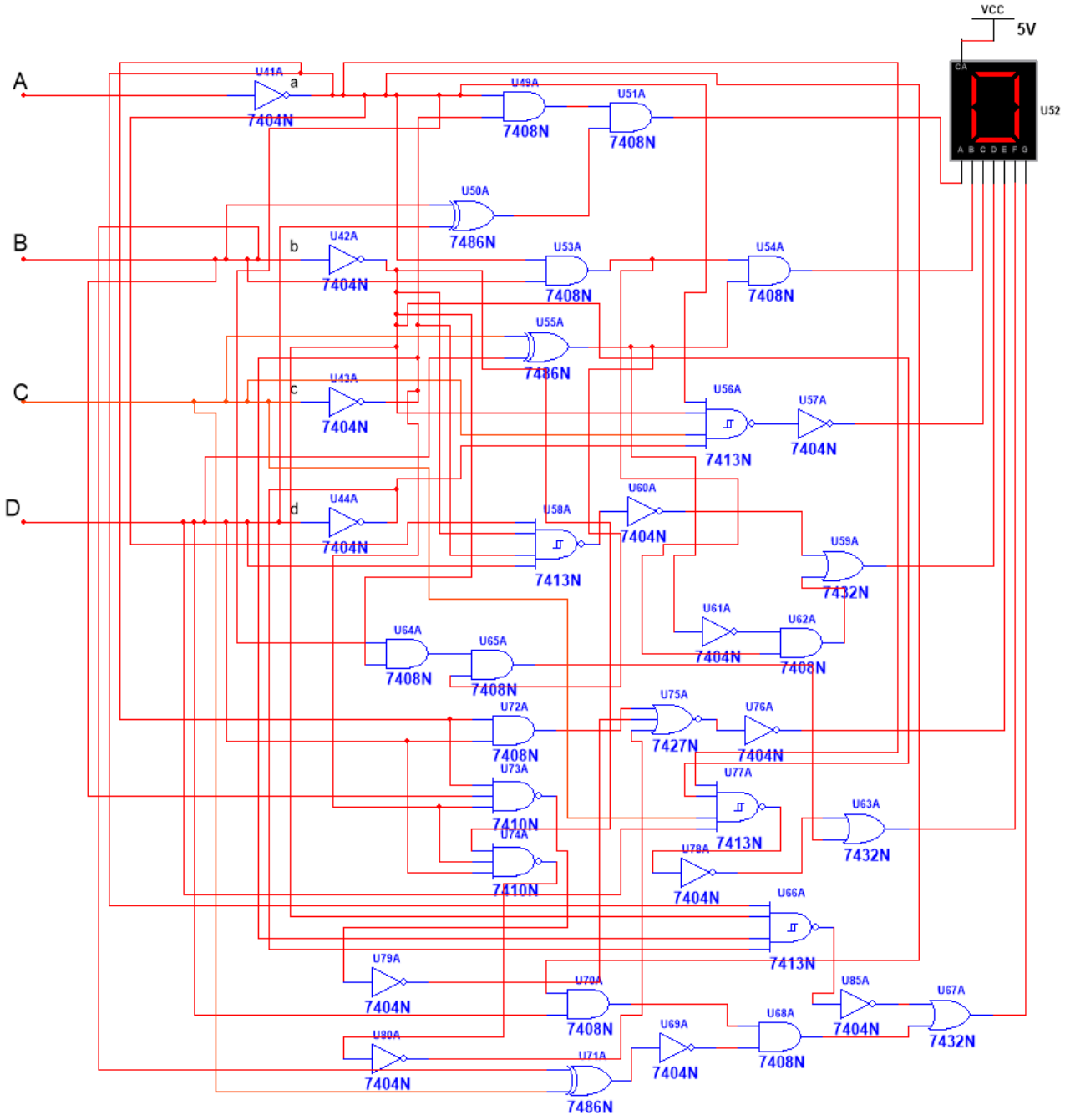
- The counter is configured as an Asynchronous counter as decade counter.
- In order to construct a mod10 counter 4 JK flip-flops are connected in series in asynchronous fashion i.e., the J output is connected to clock input to the next flip-flop.
- But here, to configure a mod10 counter we have used IC 7490 which carries out the operation of mod10 counter.
- In order to configure a MOD100 counter 2 MOD10 counters are cascaded , the outputs of each mod10 counter is 4 bits so, the output of MOD100 counter configured has 8 bits, these outputs are connected to 8 led bulbs to realize binary value of counter .
- The driver (IC7447) circuit is responsible for converting binary value to suitable 7 segment value inputs.

Binary I/p	Display	a	b	c	d	e	f	g
0000	0	0	0	0	0	0	0	1
0001	1	1	0	0	1	1	1	1
0010	2	0	0	1	0	0	1	0
0011	3	0	0	0	0	1	1	0
0100	4	1	0	0	1	1	0	0
0101	5	0	1	0	0	1	0	0
0110	6	0	1	0	0	0	0	0
0111	7	0	0	0	1	1	0	1
1000	8	0	0	0	0	0	0	0
1001	9	0	0	0	0	1	0	0

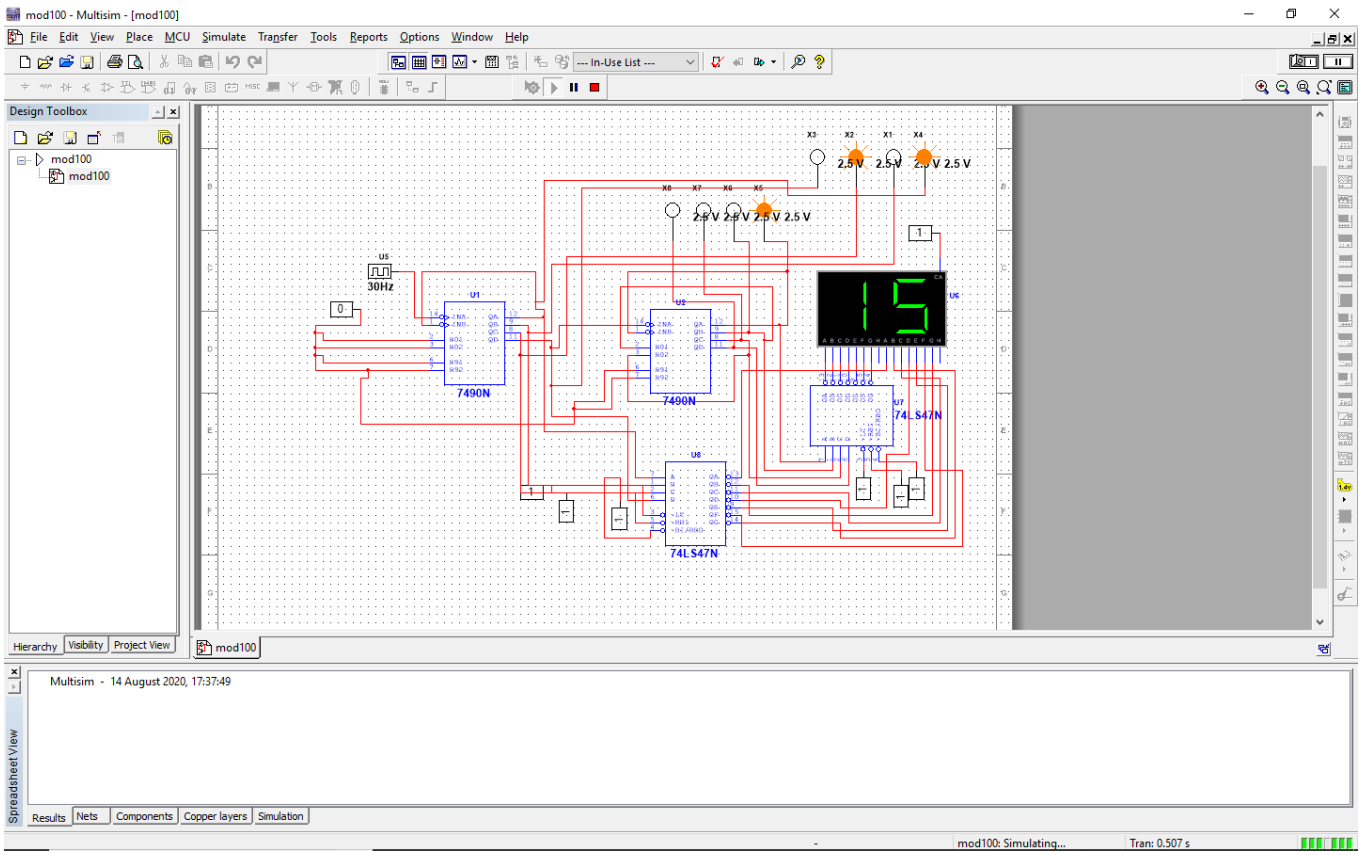
Circuit Diagram with DRIVER IC:



Circuit Diagram using basic gates:



Simulated Output Waveform:



RESULT:

MOD100 counter is designed and constructed, the counts are verified using an actual stopwatch.


Thank
you