DIGITAL SYSTEMS

PRACTICUM 10

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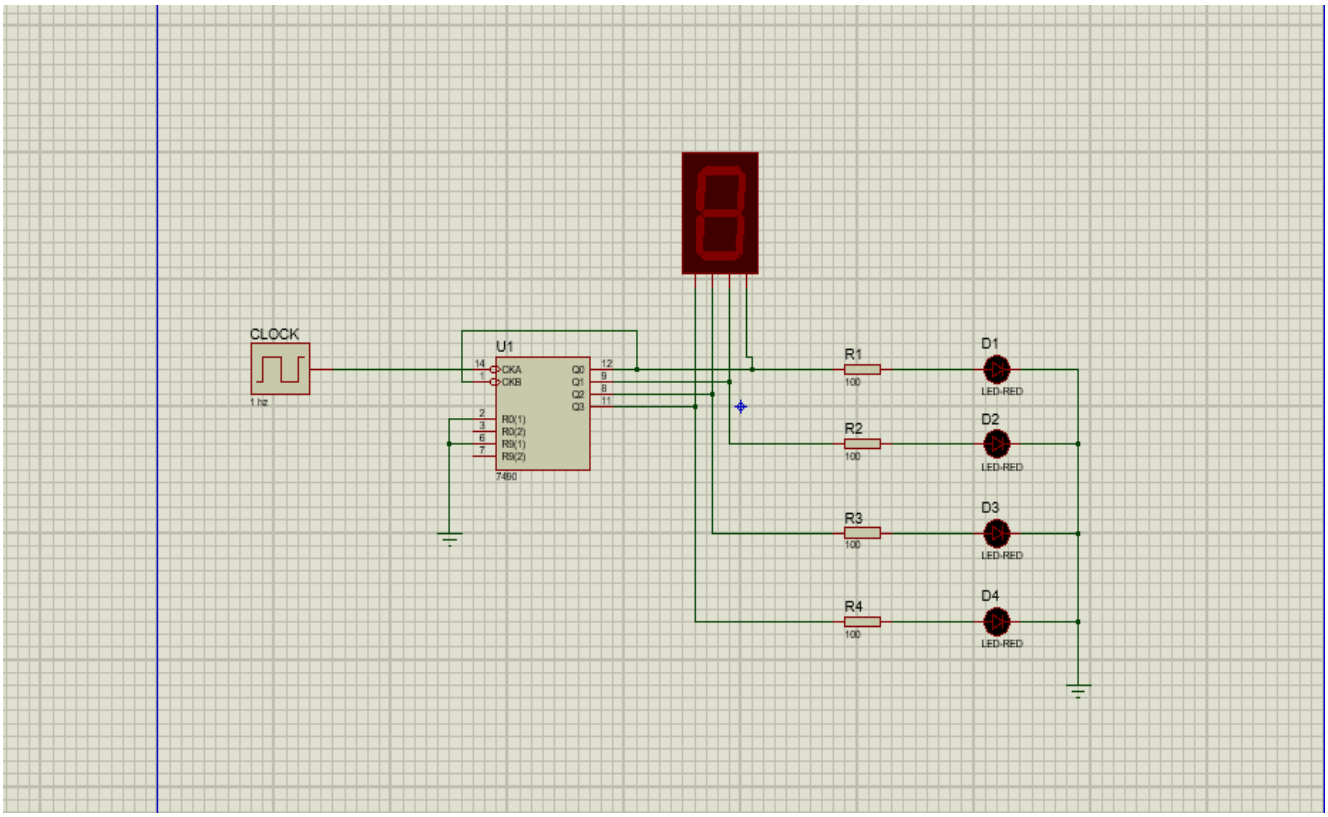
Experiment 1

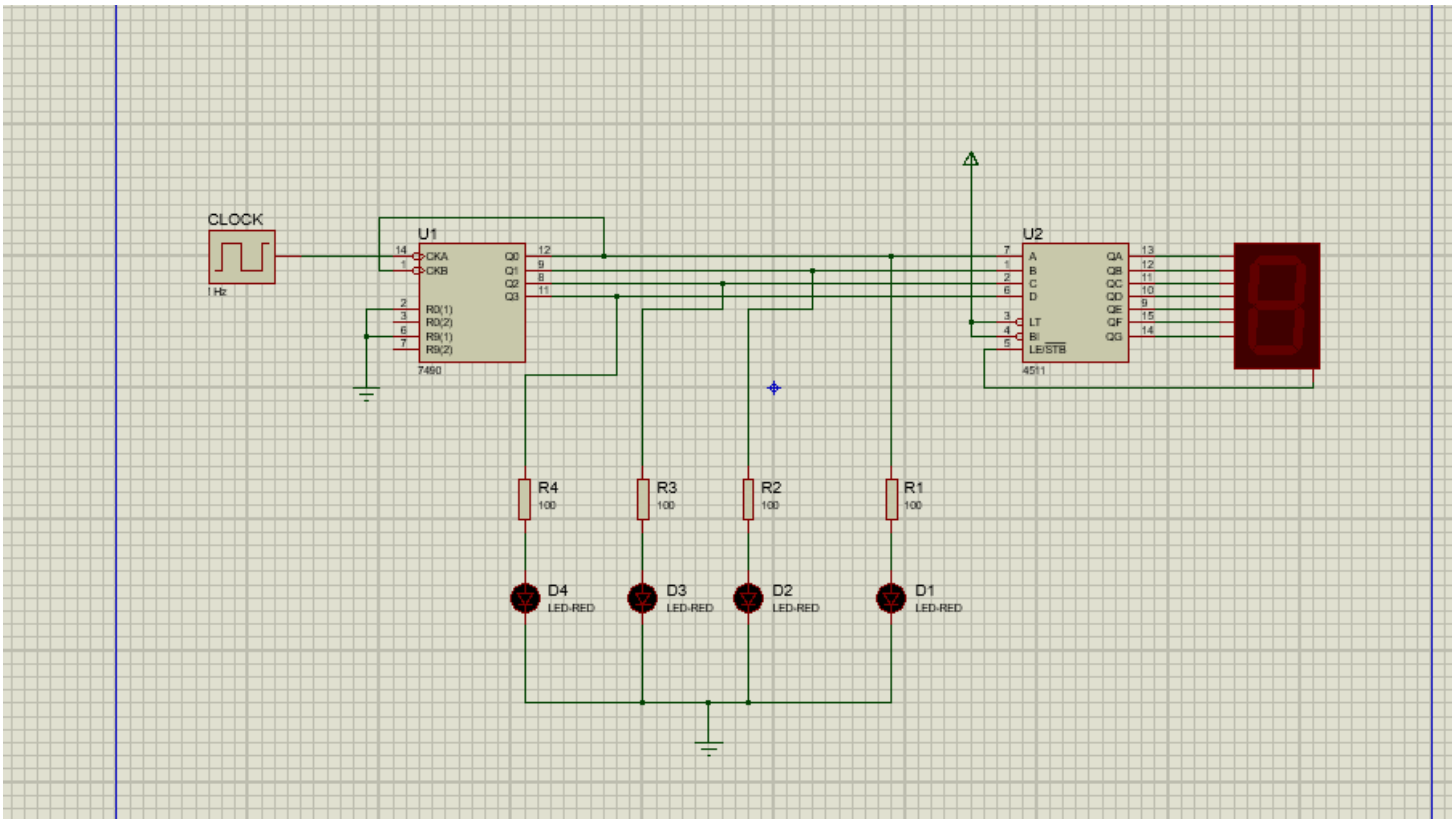


Picture 1.1. Set of clock counter

1. Column table

Input Clock	**Output LED**				**Output Seven Segment**
	D1	**D2**	**D3**	**D4**	
1	0	0	0	0	0
2	1	0	0	0	1
3	0	1	0	0	2
4	1	1	0	0	3
5	0	0	1	0	4
6	1	0	1	0	5
7	0	1	1	0	6
8	1	1	1	0	7
9	0	0	0	1	8
10	1	0	0	1	9

Experiment 2



Picture 2.1. Addition of a BCD-to-segment decoder

1. Column table

Input Clock	Output LED				Output Seven Segment
	D1	D2	D3	D4	
1	0	0	0	0	0
2	1	0	0	0	1
3	0	1	0	0	2
4	1	1	0	0	3
5	0	0	1	0	4
6	1	0	1	0	5
7	0	1	1	0	6
8	1	1	1	0	7
9	0	0	0	1	8
10	1	0	0	1	9

2. Comparison of experiment 1 and experiment 2

   In experiment 2, number 6 looks like the letter b and the number 9 looks like the letter q on the 7 segment. but in experiment 1, everything looks normal.

3. Is it true that 7seg-BCD is the same as the BCD-to-7 segment decoder?

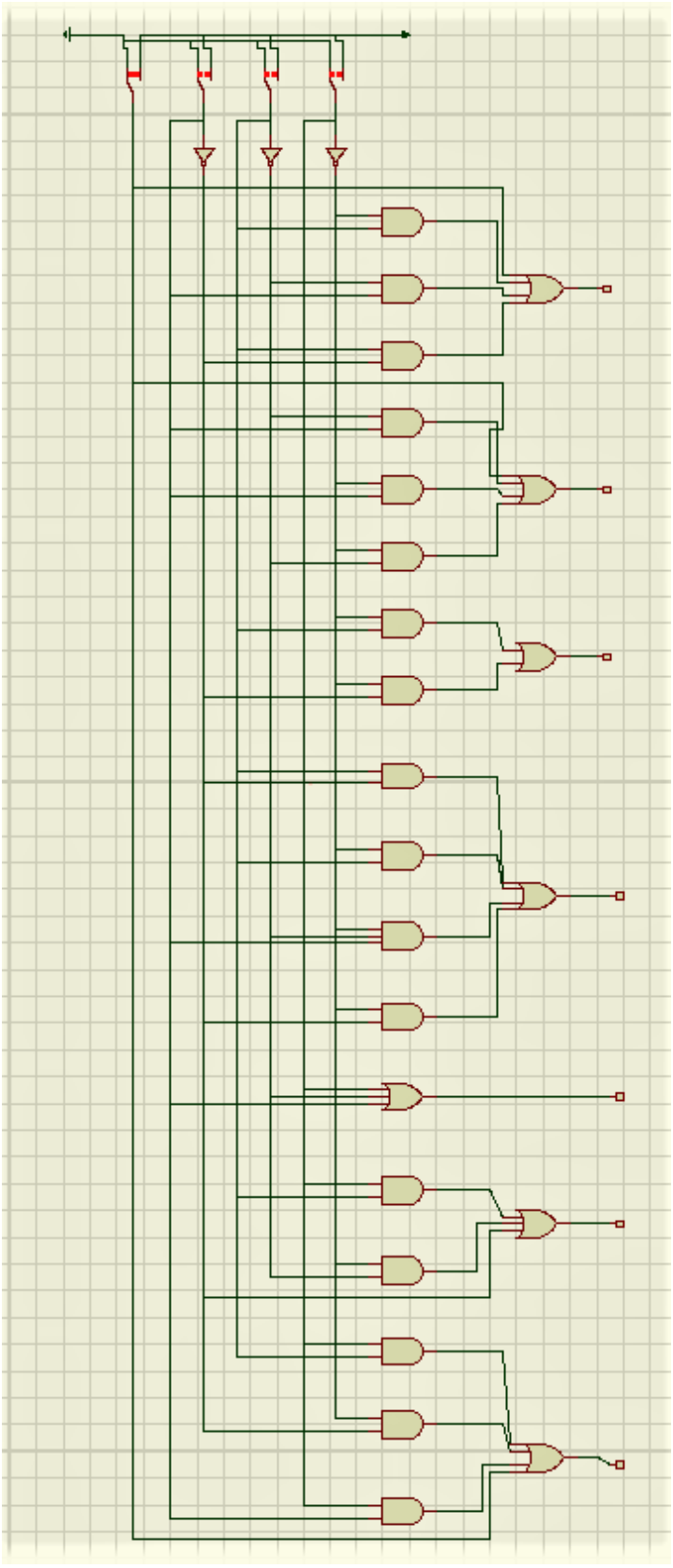
   Answer : Yes

Experiment 3

1. Table function of IC 4511

Decimal Digit	Input					Output							Display Output
	LT	D	C	B	A	a	b	c	d	e	f	g	
0	H	L	L	L	L	H	H	H	H	H	H	L	0
1	H	L	L	L	H	L	H	H	L	L	L	L	1
2	H	L	L	H	L	H	H	L	H	H	L	H	2
3	H	L	L	H	H	H	H	H	H	L	L	H	3
4	H	L	H	L	L	L	H	H	L	L	H	H	4
5	H	L	H	L	H	H	L	H	H	L	H	H	5
6	H	L	H	H	L	L	L	H	H	H	H	H	6
7	H	L	H	H	H	H	H	H	L	L	L	L	7
8	H	H	L	L	L	H	H	H	H	H	H	H	8
9	H	H	L	L	H	H	H	H	L	L	H	H	9
LT	L	X	X	X	X	H	H	H	H	H	H	H	8

2. The output "a" (highlight) in the table shows that LED works in seven common cathode segments
3. Each output shows the state of LED from seven segment various conditions
4. Each LED is controlled by a combination of logic gates.



Picture 3.1. Complete diagram logic from BCD-to-7segment decoder

5. Comparison truth table with set of BCD-to-7segment

   The output results in the BCD-to-7-segment decoder circuit produce a value that exactly matches the truth table