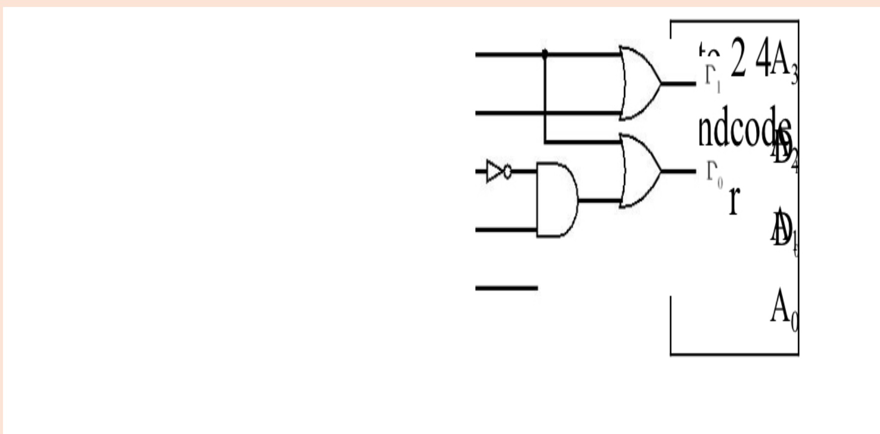
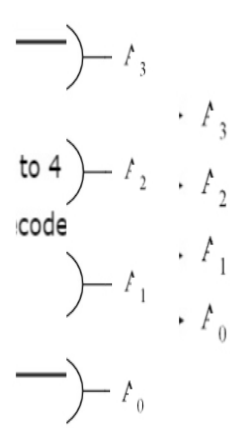
وزارة التعليم العالي والبحث العلمي كلية المستقبل الجامعة قسم/ هندسة تقنيات الحاسوب مختبر/ الكترونيك رقمي	رمز السجل: تاريخ الإصدار: رقم الإصدار: المرحلة : الاولى

سجل التجارب للعام الدراسي 2020 - 2021

Name of Experiment: - Decoder and Encoder Circle.



الشكل 1 دائرة Encoder.



the purpose of the experiment:-

Understand the design of both the Encoder circuit and the Decoder circuit.

the theory:-

The Encoder circuit is used to generate a set of special codes for each entry, so that the given codes are not repeated between different entries.

The number of exits for the department depends on the number of entries in it, as follows:

عدد الادخالات	عدد الاخراجات
4	2
8	3
16	4

As shown above, the number of entries is 2n, the number of outputs is equal to n, and the reason behind this is that the system adopted in the design is binary, and therefore if we have the number of outputs equal to 2, there are 22, or 4 different symbols formed from two binary orders, and therefore the number of entries for the circuit can be 4. The greater the number of required symbols, and by applying the rule, one can know the number of entries and exits for the circuit.

In digital design, when a particular circuit is used to convert a group of signals, there is a circuit that cancels this conversion, as the Decoder circuit is the expression of the opposite circuit to the Encoder circuit in terms of composition and function.

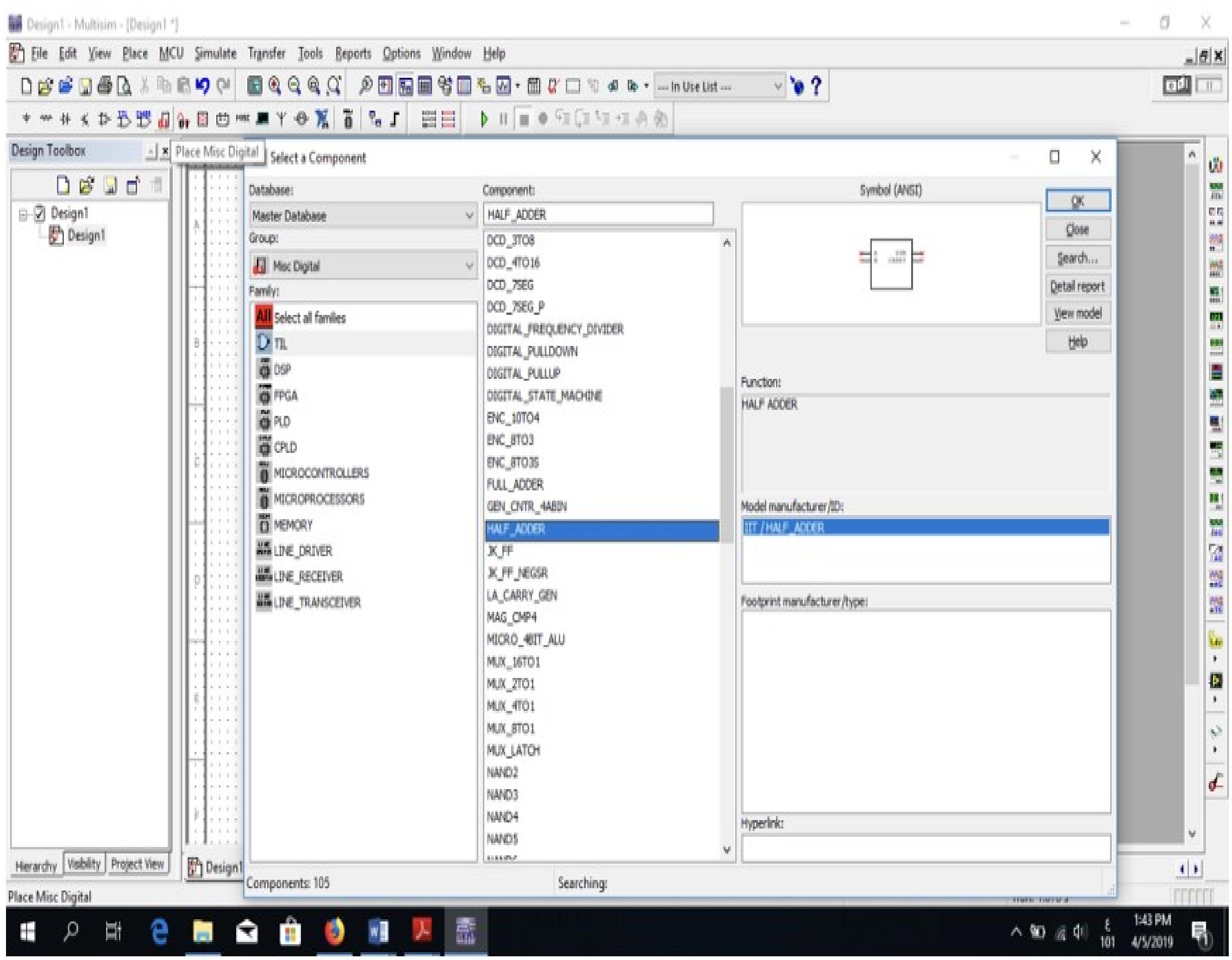
The Decoder circuit activates outputs according to the symbols entering the circuit.

There is a slight difference between the two circuits in Figures 1 and 2, which is the E signal, as it can be used to turn on and off the Decoder circuit when needed.

equipment and tools:-
Multisim program.

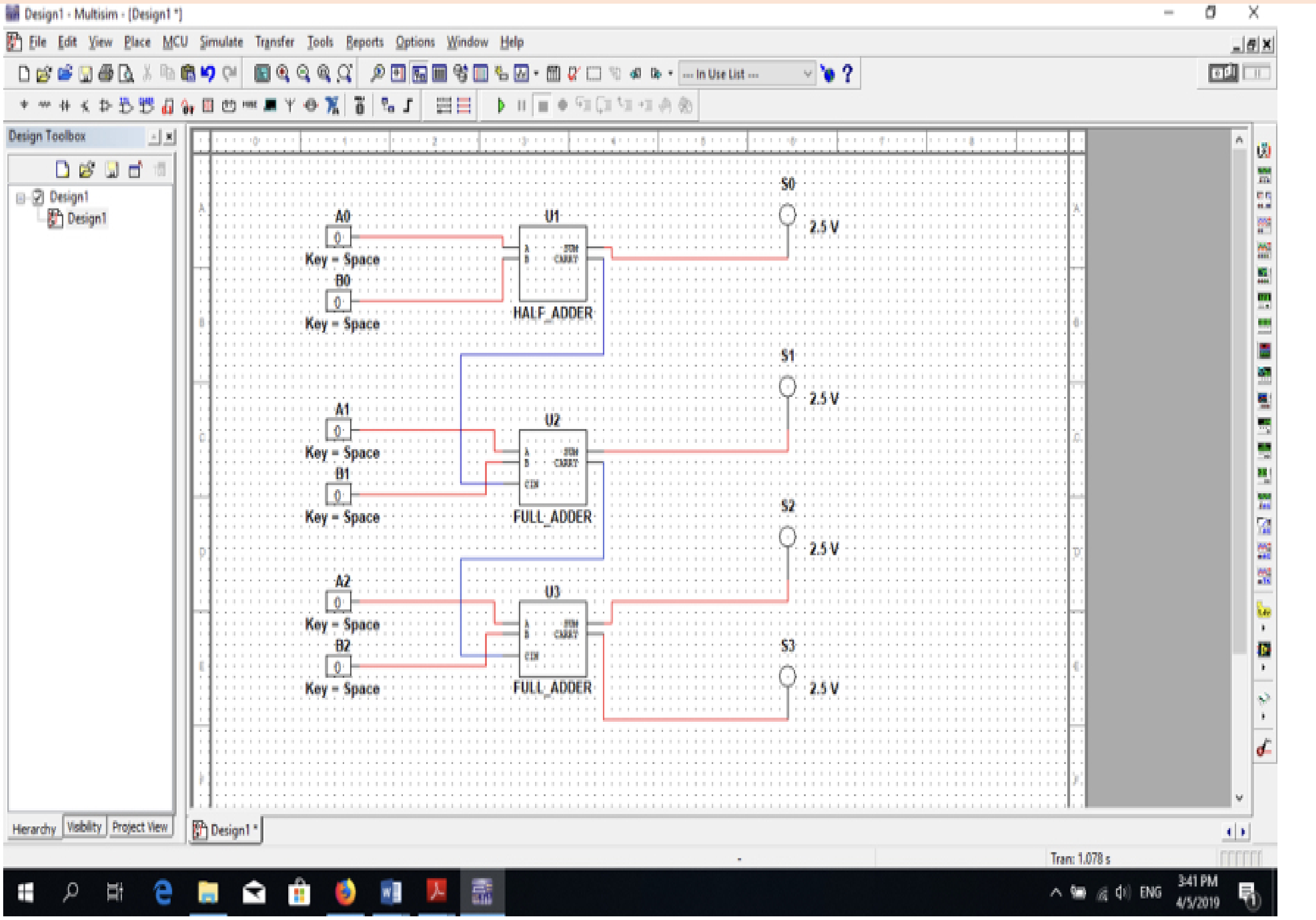
The method of work :-

1- Using the element bar, we choose the Half Adder circle number 1 from the list and the Full Adder circle number 2 from the Place Misc Digital list as shown in Figure 2.
2- Using the element bar, we select the 8 digital sources and rename them as in Figure 1, where the group (A2 A1 A0) represents the first decimal number A and the group (B2 B1 B0) represents the second decimal number B.



الشكل 2 اختيار دائرة Half Adder.

3- Using the element bar and from the Place Indicator menu, we choose 4 lamps type PROBE, which represents the output of the circuit as in Figure 3.



الشكل 3 ربط دائرة Parallel Adder لحساب ناتج ثلاثة ادخالات.

Standard Results: -

We use Table 1 to find the truth table for Parallel Adder using entries.

جدول 1

C_0	S_0	S_1	S_2	B_0	B_1	B_2	A_0	A_1	A_2
				1	0	0	0	0	0
				0	1	0	0	0	0
				1	1	0	1	0	0
				0	0	0	1	1	0
				1	1	0	0	1	0
				1	0	1	0	1	0
				0	1	1	1	0	1
				0	0	1	1	0	1
				1	1	0	0	0	1
				1	0	1	0	1	1
				0	1	1	1	1	1
				1	1	1	1	1	1

Discussion and Conclusions:

1- Repeat the previous experience using:

a. Half Adder circuits.

b. Full Adder circuits.

2- Design an integrated circuit to find the quotient of subtracting two numbers between 0-7?