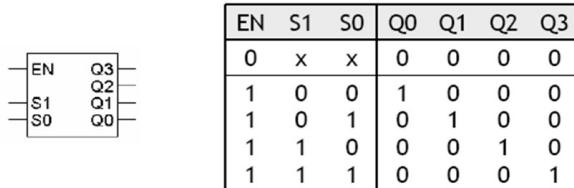


King Saud University
College Of Computer & Information Sciences
 Department Of Computer Sciences
CSC - 220 (Fall – 2010)
Lab 2 # (Digital Components)

Using Digital Works software to implement the following logic circuits:

Question # 1

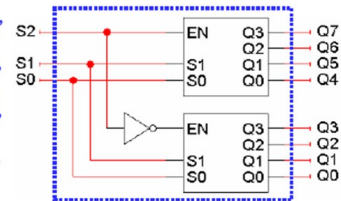
(a) Using Digital Works, Construct the following 2-to-4-line decoder



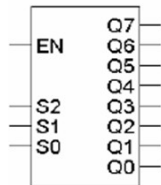
(b) Using Digital Works, Construct a 3-to-8-line decoder with two 2-to-4-line decoders without enable as shown:

S2	S1	S0	Q0	Q1	Q2	Q3	Q4	Q5	Q6	Q7
0	0	0	1	0	0	0	0	0	0	0
0	0	1	0	1	0	0	0	0	0	0
0	1	0	0	0	1	0	0	0	0	0
0	1	1	0	0	0	1	0	0	0	0
1	0	0	0	0	0	0	1	0	0	0
1	0	1	0	0	0	0	0	1	0	0
1	1	0	0	0	0	0	0	0	1	0
1	1	1	0	0	0	0	0	0	0	1

$Q0 = S2'S1'S0'$
 $Q1 = S2'S1'S0$
 $Q2 = S2'S1'S0'$
 $Q3 = S2'S1'S0$
 $Q4 = S2'S1'S0'$
 $Q5 = S2'S1'S0$
 $Q6 = S2'S1'S0'$
 $Q7 = S2'S1'S0$



(c) Using Digital Works, Construct a small circuit to add enable to the designed circuit in (a) as shown



Question # 2

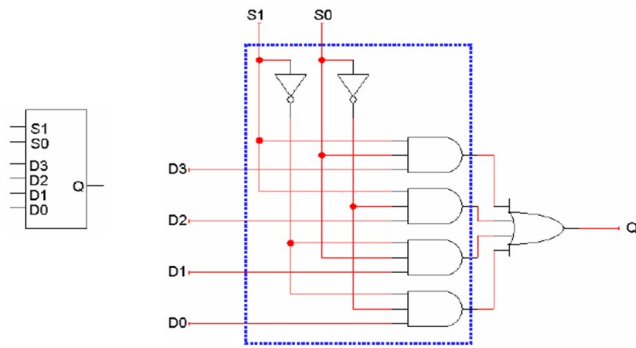
Using Digital Works, Design the logic diagram of a 2-to-4-line decoder. Include an enable input.

Question # 3

Using Digital Works, Design the logic diagram of an eight-input, three-output encoder. What is the output when all the inputs are equal to 0? What is the output when only input D0 is equal to 0?

Question # 4

- (a) Design 2-to-1-line multiplexer.
- (b) Design the following 4-to-1-line multiplexer



Question # 5

Design a 8-to-1-line multiplexer with two 4-to-1-line multiplexers and one 2-to-1-line multiplexer. Use macros to design the three multiplexers.

Question # 6

Use 3-to-8-line decoder in Question 1 as macro to implement the following Full Adder

