

DESIGN FOR TESTABILITY

Assignment-2

1. Calculate the SCOAP controllability and observability measures of all nodes of a three input XOR gate and its only NAND and only NOR implementations.
2. Calculate the SCOAP controllability and observability measures of all nodes of a full adder circuit implemented using:
 - (i) AND, OR and NOT gates
 - (ii) Only NAND gates
 - (iii) Only NOR gates
3. Calculate the combinational observability of input a_i at output s_k , denoted by $O(a_i, s_k)$, where $k > i$, for an n -bit ripple carry adder.
4. Calculate the SCOAP controllability and observability measures of all nodes of a 4 bit magnitude comparator circuit.
5. Repeat problem no. 4 for a 4 bit ALU implementing the following operations: add, subtract, add with carry, subtract with borrow, AND, OR, XOR, NOT, data transfer, equality comparison, greater than comparison, less than comparison.
6. Calculate the SCOAP controllability and observability measures of all nodes in the following circuit shown in figure 1:

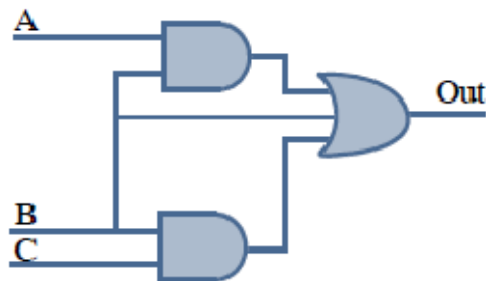


Figure 1

7. Here you are given a simple circuit in figure 2 which is divided into blocks. Test all the blocks by using different techniques of introducing test points as given in resources. Show how do you test each block with diagrams and mention all the steps followed.

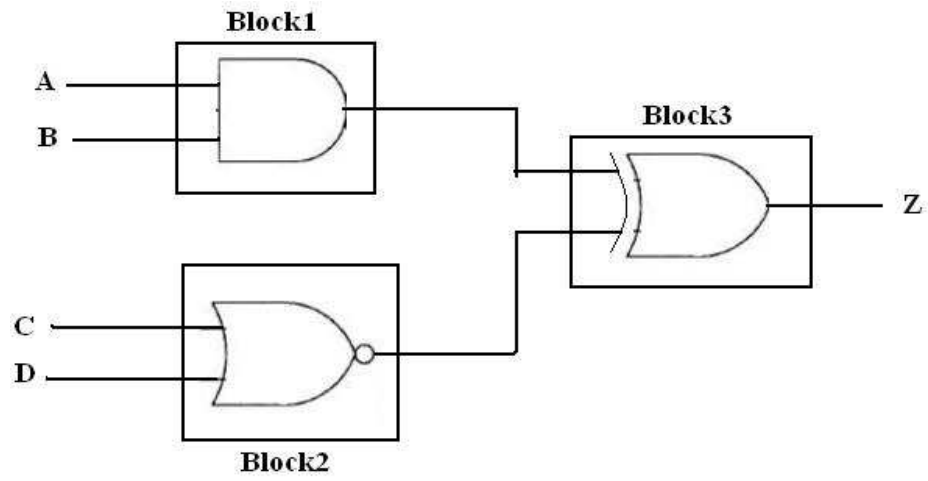


Figure 2