National Chiao Tung University
Dept. of Computer & Information Science
Introduction to VLSI Design, Fall 2000

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Handout #18
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Sample Solutions to Extended Homework #3

1. 6 tracks is needed. See Fig. 1.

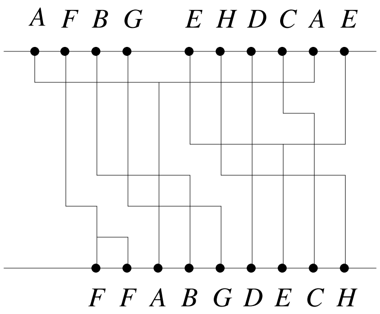

Figure 1: Routing result using dogleg channel router.

2. See Fig. 2 for illustration.

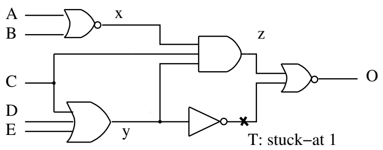

Figure 2: Test stuck-at 1 on T

To test stuck-at-1, we need to set 0 on T, ⇒ y=1.
And the gate output must be observed, ⇒ z=0.
Therefore, at least one of the C, D, E must be 1, and at least one of the x and C must be 0.
If x is 0, at least one of the A and B must be 1.
If C=0, both A and B can be either 0 or 1. And one of D and E must be 1.
If one of A and B is 1, at least one of the C, D, E must be 1.
The test patterns are shown in the following table (x means don't care):

A	B	C	D	E
x	x	0	1	x
x	x	0	x	1
1	x	1	x	x
1	x	x	1	x
1	x	x	x	1
x	1	1	x	x
x	1	x	1	x
x	1	x	x	1