ALUOp		Function code fields					
ALUOp1	ALUOp0	F5	F4	F3	F2	F1	F0
0	1	X	X	X	X	X	X
1	X	X	X	X	X	1	X

a. The truth table for Operation2 = 1 (this table corresponds to the second to left bit of the Operation field in Figure D.2.1)

ALUOp		Function code fields					
ALUOp1	ALUOp0	F5	F4	F3	F2	F1	F0
0	X	X	X	X	X	X	X
X	X	X	X	X	0	X	X

b. The truth table for Operation1 = 1

ALUOp		Function code fields					
ALUOp1	ALUOp0	F5	F4	F3	F2	F1	F0
1	X	X	X	X	X	X	1
1	X	X	X	1	X	X	X

c. The truth table for Operation0 = 1

FIGURE D.2.2 The truth tables for three ALU control lines. Only the entries for which the output is 1 are shown. Th e bits in each fi eld are numbered from right to left starting with 0; thus F5 is the most signifi cant bit of the function fi eld, and F0 is the least signifi cant bit. Similarly, the names of the signals corresponding to the 4-bit operation code supplied to the ALU are Operation3, Operation2, Operation1, and Operation0 (with the last being the least signifi cant bit). Thus the truth table above shows the input combinations for which the ALU control should be 0010, 0001, 0110, or 0111 (the other combinations are not used). Th e ALUOp bits are named ALUOp1 and ALUOp0. Th e three output values depend on the 2-bit ALUOp field and, when that field is equal to 10, the 6-bit function code in the instruction. Accordingly, when the ALUOp field is not equal to 10, we don't care about the function code value (it is represented by an X). There is no truth table for when Operation3=1 because it is always set to 0 in Figure D.2.1. See Appendix B for more background on don't cares.