

CS 3853 Midterm Exam 1 — Two Sample Problems (From Spring 2013)

1) (10 points, 1 point each) This problem refers to Figure C.22.

Suppose that we are executing the instruction: DADD R1, R2, #3 and that before this instruction executes, R1 = 7, R2 = 9. What are the values on the following lines in the Basic Pipeline diagram? Fill in each table entry with a decimal number.

Description	Value	Description	Value
IR _{6..10}		IR _{11..15}	
top Registers output		bottom Registers output	
Mux A output		Mux B output	
ALU output		Mux D output	
MEM/WB.IR Register input		bottom Registers input	

2) (9 points, 1 point each) This problem refers to Figure C.22. Consider the sequence of instructions and the initial values of the registers given below.

DADD R1, R2, R3

AND R4, R5, R6

OR R7, R8, #7

DADD R9, R1, #13

R1	R2	R3	R4	R5	R6	R7	R8	R9
12	13	17	18	19	21	25	26	28

Assume that the first instruction is fetched in cycle 20. Fill in the following table with the values (in decimal).

Description	cycle	value	Description	cycle	value	Description	cycle	value
IR _{6..10}	22		IR _{6..10}	23		IR _{6..10}	24	
Mux B output	24		Mux D output	25		MEM/WB.IR Registers input	25	
Mux B output	25		Mux D output	27		MEM/WB.IR Registers input	26	