

CS220 Spring 2012 Quiz 6 Name: _____

1. [4 points] Convert the base-10 decimal number -3.5625_{ten} to IEEE single precision floating point representation. Express your answer in hexadecimal.

$-3.5625_{ten} = -11.1001$ in base two

normalized this is -1.11001×2^1

so the exponent is $1 + 127 = 128 = 10000000_{two}$

and the mantissa is 11001

1100 0000 0110 0100 0000 ...

$C0640000_{hex}$

2. [3 points] Multiply the two 4-bit binary numbers 1010 (multiplicand) and 1001 (multiplier) tracing the values of the product, multiplicand, and multiplier at each step.

multiplicand	multiplier	product
		00000000
00001010	1001	00001010
00010100	0100	00001010
00101000	0010	00001010
01010000	0001	+ 01010000
		01011010 = 90_{ten}

3. [3 points] Consider the two waveforms for the inputs of a D-latch (flip-flop). Draw the corresponding waveform for Q. Use the vertical lines to line up your output.

