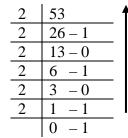
CDA 3103 – Computer Organization Spring 2005 Quiz # 1 – Solution

Last Name	:	 First Name	:	
NID	:			

Question # 1: Using 2's complement representation, Convert -53 into an 8-bit binary number. [5 points]

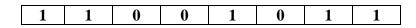


$$(53)_{10} = (110101)_2 = {}^{8\text{-bit number}} (00110101)_2$$

It is a negative number, so we will take complement of number and then will add 1.

$$\begin{array}{ll} 00110101 & = \frac{\text{complement}}{\text{add 1}} & 11001010 \\ & = \frac{\text{add 1}}{\text{11001011}} \end{array}$$

Final Answer



Question # 2: What is the decimal equivalent of this 8-bit 1's complement binary number? [5 points]

Last '1' shows that it's a negative number. Number is in 1's complement form so its complement will give us its magnitude.

11100101 =
$$\begin{array}{ccc} & 00011010 & \text{(no need to add 1 as it is NOT 2's complement)} \\ & = & 2^4 + 2^3 + 2^1 \\ & = & 16 + 8 + 2 & = & 26 & \text{(it is magnitude of negative number)} \end{array}$$

<u>Final Answer</u> (<u>- 26</u>) ₁₀