Please print out this form (two-sided, if you can) and write your answers legibly in the spaces provided. If you can’t write legibly, type.

1. Draw a circuit diagram of a multiplexor using only AND gates, OR gates and inverters.

2. Re-write the calculator VHDL to add a flip operation that complements all bits in $dReg$ (that is, it converts 0s to 1s and 1s to 0s). Note, if $X$ is a signal in a VHDL specification, then $\overline{X}$ its logical complement.
3. Let 101101 denote a number in a 6 bit 2s-complement number system. Is this value positive or negative? How do you know? What is the corresponding binary value with the opposite sign? What is its decimal equivalent? In a 6 bit 2s-complement system, what is the smallest negative number? What is the largest positive number?