1. Convert the two decimal numbers into signed 8-bit numbers in the following representations. Use 2's complement representation.

Signed Decimal	Binary	Hex
32		
-64		

2. Design a minimum-cost SOP circuit that implements a three-variable majority function.

3. Design the simplest circuit that implements the function f =A ⊕ B ⊕ C using NOR gates.

4. Perform the following operations involving 8-bits 2's complement numbers, and indicate whether a carry and/or an arithmetic overflow occurs in each case.

0001 0101	1110 0101
+ 1001 1110	- 1101 0110

5. Implement the function f(x1,x2) = ∑m(0,3) using a 2-to-4 binary decoder and an OR gate.

6. Implement the function $f(w_1, w_2, w_3) = \overline{w}_1 \ \overline{w}_3 + w_1 w_2 + w_1 w_3$ using a 4-to-1 Mux and other gates. Use w_1 and w_2 as selectors.