Remarks:

• Exam time: 1:00PM – 1:50PM

• Please write your name at the top-right corner of each page of your exam papers.

• Two pages of cheat sheets are allowed (back and forth).

• You are allowed to leave early. But, please drop your solution along with the exam papers. You don't need to drop your cheat sheet(s).

• GOOD LUCK!

Problem #	1	2	3	4
Total points	10	10	10	20
Student scores				

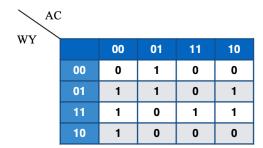
1. Perform the following operations involving 7-bit 2's complement numbers. Find the decimal values of the resulting 2's complement numbers. Indicate whether arithmetic overflow occurs or not.

$$0110101$$
 -1001111

2. Find the simplest product-of-sums (SOP-POS) expression for *g*. Show your work.

$$g(a, b, c) = M_0 M_2 M_3 M_4$$

3. Find the simplest sum-of-products (SOP) expression for the function F whose K-map is shown below, where A, C, W, and Y are the inputs.



4. Complete a combinational circuit design using the given Multiplexers and logic gates (if needed) that fulfills the function $f(x_1, x_2, x_3, x_4) = M_2 M_5 M_7 M_{10} M_{14}$. Show all your work.

