EXPLANATIONS

Problem #1

When we solve the problem without the weights, we find that the optimal number of invitees are 40,000 CMC customers and 30,000 non-CMC customers with 2000 non-CMC customer over our goal of 5,000. When we rerun the problem with the weights, we get an optimal number of invitees are (again) 40,000 CMC customers and 30,000 non-CMC customers with 2000 non-CMC customer over our goal of 5,000. It appears the number of non-CMC customer over the goal of 5000 is the same. Note that the invitee count remains the same.

Problem #2

When we want to have all the rooms covered with the minimum number of cameras we get a solution of 4 cameras at locations 3, 6, 10, and 11. When management wants to have extra coverage on room 7, we update the constraint for that room to be >= 2 instead of >= 1 like in the previous step. This yields a solution of 5 cameras at locations 1, 7, 9, 11, and 12.

Problem #3

The changes to the objective functions in part 2 and 3 do not change the optimal solution of x=30, y=60 but the maximum profit value does change, which is logical. The objective function with the highest profit was 8x+6y.