Question 1)

1. Since we just need the variables to express whether a person is going on the car or not and since we have six people, we just need 6 people. Since there are two choices for each person, there are assignments in total.
2. a)

b)

c) implies

d) implies

imples

1. Yes it is satisfiable. One such solution is are true. are false.

Question 2)

1. See email
2. Since there are twenty variables and each variable can take on at most two possible choices, there are variable assignments
3. Since k is at most twenty, a small number, we can just run the experiment with all possible values of k and determine the best possible k. In cases where k can take on more values, we could use greedy search or another algorithm to find k.

Question 3)

1. 10P10 = 10! = 3628800
2. 9 since you can’t swap with yourself
   1. (8 9 7 6 5 4 3 2 1 0)
   2. (7 8 9 6 5 4 3 2 1 0)
   3. (6 8 7 9 5 4 3 2 1 0)
   4. (5 8 7 6 9 4 3 2 1 0)
   5. (4 8 7 6 5 9 3 2 1 0)
   6. (3 8 7 6 5 4 9 2 1 0)
   7. (2 8 7 6 5 4 3 9 1 0)
   8. (1 8 7 6 5 4 3 2 9 0)
   9. (0 8 7 6 5 4 3 2 1 9)
3. After you finish making 10 swaps (where 10 is the number of elements), you wrap around to the beginning, so essentially during the iteration, you are swapping at position . Therefore, during the iteration, you will swap at position 1.