Karnaugh Maps , Lab 4

The purpose of this lab is to demonstrate understanding of Karnaugh maps, minimalization of expressions, and how it will affect the don't care output. This lab will build one circuit.

Consider the following Boolean function:

f (A, B, C, D) = A'B'C'D'+A'B'CD+A'BC'D+A'BCD+ABCD+AB'CD+AB'CD'
with don't cares for AB'C'D', ABC'D, and A'B'CD'

1. Build a truth table of the function.
2. Construct a Karnaugh map (K-Map).
3. Determine the prime implicants and essential prime implicants.
4. Develop a simplified expression in the sum of products form.
5. Implement the function using the simplified expression.
   Draw your circuit design and build.
6. What are the outputs corresponding to the don't care cases? Why does the circuit return these results? Include this answer in your lab report.