Name: \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_ unique name: \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_

**Honor code:**

I have not given or received aid on this quiz, nor have I observed anyone else doing so:

Sign here:\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_

This quiz is graded out of 100 points and is worth about 4% of your class grade***Closed everything including calculators!*** To receive partial credit, work must be shown.

**Q1**

D Q

C Q'

**Out**

**Q0**

**Bob**

D Q

C Q'

**Clk**

1. Draw the state transition diagram for the above circuit. You should assume “00” is the initial state. Please label each state as “Q1Q0” (so if Q1=1 and Q0=0 the label would be “10”). Don’t include unreachable states (if any). **[50]**
2. Find the minimal sum-of-products of F using the Quine-McClusky algorithm. For this problem we’ll be grading your answer primarily based on your work so be sure to be careful, clear and neat. Use the format provided. **[50]**

F=ΣA,B,C,D(0,6,9,11,12,13,14,15)

|  |  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- | --- |
| Column I | 🗸 |  | Column II | 🗸 |  | Column III | 🗸 |
| 0000 |  |  |  |  |  |  |  |
| 0110 |  |  |  |  |  |  |  |
| 1001 |  |  |  |  |  |  |  |
| 1100 |  |  |  |  |  |  |  |
| 1011 |  |  |  |  |  |  |  |
| 1101 |  |  |  |  |  |  |  |
| 1110 |  |  |  |  |  |  |  |
| 1111 |  |  |  |  |  |  |  |
|  |  |  |  |  |  |  |  |
|  |  |  |  |  |  |  |  |

List of Prime Implicants (Provide in the form AB, AC’, D)  
  
 \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_

List of distinguished ones (provide the binary value of each distinguished one):

\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_

Minimal sum-of-products: \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_