CIS 310 Exam # 2

Winter 2021

YOUR NAME \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_

It is an open-book and open-note exam. You may discuss conceptual issues with your friends, but you have to write own answers.

Upload your answers by the midnight, 3/28/21 (Sun)

Each problem is worth 20 points.

1. Assume that 100 integers of length word (2-bytes) are stored at ARRAY. Write an assembly language program segment to add them up.

.data

ARRAY word 205, 89, ,,,,,,,,,,,

.code

1. Write assembly language program segments for the following pseudo code.
2. if (op1 == op2)

X=1;

Else X=2;

ii. While (EAX < EBX)

EAX = EAX + 1 ;

1. Simplify the following Boolean function:

F (A, B, C) = Σ (0,2,3,4,6)

1. Using De Morgan’s Law, show (A + B)’ (A’ + B’)’ = 0
2. Design a 2-bit count-down counter. This a sequential circuit with two flip-flops and one input x. When x=0, the state of the flip-flop does not change. When x = 1, the state is 11,10, 01, 00, 11 and repeat. Use JK flip-flops.

JK flip flop EXCITATION TABLE:

Q(t) Q(t+1) J K

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

0 0 0 X

0 1 1 X

1 0 X 1

1 1 X 0

a. Based on the statement above, draw the state diagram.

b. Based on part (a) above, construct the state table.

C. Obtain the equations for JA KA JB KB

d. Sketch the circuit.