## **EEM16** Quiz #1

#### Hiromu Ikeda

TOTAL POINTS

### 20 / 20

#### **QUESTION 1**

- 1 Part (a) and Part (b) 8 / 8
  - 0 (a) Correct
  - 0 (b) Correct

#### QUESTION 2

- 2 Part (c), Part (d), and Part (e) 12 / 12
  - 0 (c) Correct
  - 0 (d) Correct
  - 0 (e) Correct

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# Quiz #1

Name (Last, First): Tkely, Hirany

Student Id #: 604814 137

#### Do not start working until instructed to do so.

- 1. You must answer in the <u>space provided</u> for answers after every question. We will ignore answers written anywhere else in the booklet. <u>All pages in this booklet must be accounted</u> for otherwise it will not be graded.
- 2. This quiz is closed book/notes.
- 3. You may not use any electronic device.

Following table to be filled by course staff only

	Maximum Score	Your Score
TOTAL	20	

Consider the Boolean function defined by the truth table below where A, B, and C are inputs, and Y is the sole output.

Α	В	С	Y
0	0	0	1
0	0	1	0
0	1	0	0
0	1	1	1
1	0	0	1
1	0	1	1
1	1	0	0
1	1	1	х

(a) Without doing any logic minimization, write the expression for Y in Fully-Disjunctive Normal Form.

Show supporting work below:

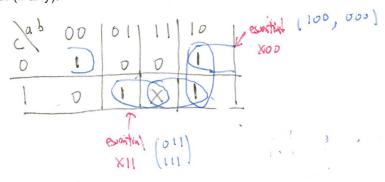
(b) Use the function in (a), write the expression for  $\neg Y$  in Fully-Disjunctive Normal Form.

Show supporting work below:

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(c) Draw the Karnaugh map of the truth table, circle the prime implicants, indicate which one(s) are essential (if any).



(d) Using the results in (c), repeat part (a) with a sum-of-product expression using the fewest number of terms and literals.

Y= (bnc) U (bnc) U (anb)

(e) Show a combinational circuit that implements Y (with A, B, and C as inputs) using only inverters and NAND gates.

