

Assignment – 2

Rules for Assignments

Purpose:

The assignments will primarily be practice problems for the exams. Thus, you should not collaborate on it with others by splitting the work and sharing answers. You will gain the most benefit from doing it by yourself. You can, of course, ask me for help. If someone in the class asks you for help on assignments, handle the situation as if you are a course instructor. Don't just give them an answer, but make sure they know how to find the answer on their own. *If I feel that people have submitted answers that are merely copies of each other, I will grade the one solution and divide the credit for it equally among the copies.*

Due Date:

The due date for the submission of this assignment is 6th Mar. 2010 (Saturday).

Late Policy:

You must do your work on time because we'll be correcting/discussing it in class. *No assignment will be accepted after the due date.* If you know that you have a specific time conflict, make arrangements with me in advance for a separate assignment for late submission.

Format:

All assignments should be done according to the following format:

- Assignment must have a cover page including *title of assignment, subject, date of submission, students name, class, roll no. and submitted to.*
- For a sample of cover page, visit my website <http://www.eazynotes.com>.
- Use loose sheets with one side plain and other side lined.
- Write questions/headings with black pen and other text with blue pen.
- Draw diagrams (if necessary), neat and clean with pencil on plain side of paper.
- Pages should be numbered.
- Mention *Contents* at the beginning and *References* at the end of each assignment.

Title: Boolean Algebra & K-Maps

1. Short answer type questions:

- a. What are universal gates?
- b. Simplify $\overline{(a + b)} + \overline{(a + \bar{b})}$
- c. Prove using truth table $A + \bar{A}B = A + B$?
- d. Define the term Propagation Delay.
- e. How can you use NAND gate as inverter?

2. Long answer type questions:

- a. Minimize the following Using K-Map and Realize it with NAND Gates:

$$F(A, B, C, D) = \sum m(2, 3, 4, 5, 13, 15) + \sum d(8, 9, 10, 11)$$

- b.

- i. Convert the given expression in canonical SOP form Y: $AC + AB + BC$.
- ii. Simplify the function using Karnaugh map and implement using minimum number of logic gates. $F = \sum m(0, 2, 4, 7, 8, 13, 14)$