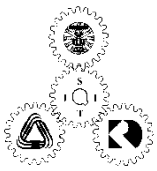


Sirindhorn International Institute of Technology

Thammasat University at Rangsit

School of Information, Computer and Communication Technology

ECS 371: Problem Set 2

Semester/Year: **1/2009**
Course Title: Digital Circuits
Instructor: Dr. Prapun Suksompong (prapun@siit.tu.ac.th)
Course Web Site: http://www.siit.tu.ac.th/prapun/ecs371/

Due date: July 2, 2009 (Thursday)

Please submit your homework to the instructor 3 minutes BEFORE your class starts.

Instructions

1. The questions are assigned from the following textbook:

   Thomas L. Floyd, *Digital Fundamentals*, 10th Edition, Pearson Education International (2009).

2. Only ONE of the problems will be graded. Of course, you do not know which problems will be selected; so you should work on all of them.
3. Late submission will not be accepted.
4. ***Write down all the steps*** that you have done to obtain your answers. You may not get full credit even when your answer is correct without showing how you get your answer.

Chapter 4

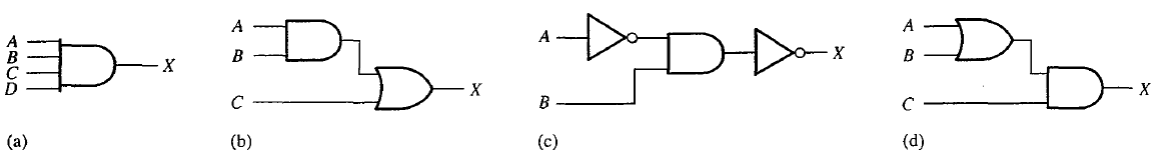
- 6(b,c,d,e), 13, 15, 20, 22

6. Find the value of X for all possible values of the variables.

(a) $X = (A + B)C + B$ **(b)** $X = \overline{(A + B)}C$ **(c)** $X = A\overline{B}C + AB$

(d) $X = (A + B)(\overline{A} + B)$ **(e)** $X = (A + BC)(\overline{B} + \overline{C})$

13. Write the Boolean expression for each of the logic circuits in Figure 4–54.



15. Draw the logic circuit represented by each expression:

(a) $A\overline{B} + \overline{A}B$ **(b)** $AB + \overline{A}\,\overline{B} + \overline{A}BC$

(c) $\overline{A}B(C + \overline{D})$ **(d)** $A + B[C + D(B + \overline{C})]$

20. Using Boolean algebra, simplify the following expressions:

(a) $(A + \overline{B})(A + C)$ **(b)** $\overline{A}B + \overline{A}B\overline{C} + \overline{A}BCD + \overline{A}B\overline{C}\,\overline{D}E$

(c) $AB + \overline{A}\overline{B}C + A$ **(d)** $(A + \overline{A})(AB + AB\overline{C})$

(e) $AB + (\overline{A} + \overline{B})C + AB$

22. Determine which of the logic circuits in Figure 4–56 are equivalent.

FIGURE 4–56