

Name: KEY

Id#

COE 202, Term 112
Digital Logic Design

Quiz# 3

Date: Saturday, March 10

Q1. Simplify the following Boolean functions **F** together with the don't care conditions **d**, into minimal **sum-of-products** expression. Identify all the *prime implicants* and the *essential prime implicants*.

$$F(A, B, C, D) = \Sigma m(2, 3, 5, 7, 10, 12, 13), d(A, B, C, D) = \Sigma m(0, 1, 5, 8, 9, 15)$$

AB \ CD	CD			
	00	01	11	10
00	X	X	1	1
01	0	1	1	0
11	1	1	X	0
10	X	X	0	1

Prime Implicants:

$$\overline{A}\overline{B}, \overline{C}D, \overline{A}D, BD, A\overline{C}, \overline{B}D$$

Essential Prime Implicants:

$$A\overline{C}, \overline{B}D$$

$$F = A\overline{C} + \overline{B}D + \overline{A}D$$