Name: KEY **Id#**

COE 202, Term 132
Digital Logic Design

Quiz# 3

Date: Sunday, March 16

Q1. For the following Boolean function F(A, B, C, D)=Σ m(0, 1, 2, 5, 6, 7, 8, 9, 10, 12, 13)

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

(i) Identify all the *prime implicants* and the *essential prime implicants* of F.

Prime Implicants: C'D, B'C', AC', B'D', A'BD, A'BC, A'CD'

Essential Prime Implicants: AC', B'D'

(ii) Simplify the Boolean function **F** into a minimal sum-of-products expression.

F =AC' + B'D' + C'D + A'BC

Q2. Consider the following Boolean function **F** together with the don`t care conditions **d**

F**(A, B, C, D)=Σ m(0, 2, 5, 8, 10),** d**(A, B, C, D)=Σ m(3, 4, 7, 9, 11, 13, 14, 15)**

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

Simplify the Boolean function **F** together with the don`t care conditions **d,** into minimal product-of-sums expression.

F' = B'D + BD'

F = (B + D')(B' + D)